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FARM CHEMICALS

The management magazine of the industry

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What's happening in bulk handling and storage of fertilizer

Production methods:

Maintaining quality control at Shell Oil of Canada's Simcoe plant

Special reports:

"Souped up" fertilizer promotion gets results

Midwestern agronomists —fertilizer industry representatives meet

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"Mel" Wierenga explains:

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EXTENSIBLE CLUPAK* PAPER

Ask your salesman about this revolutionary new material... prove to yourself that multiwall bags made of CLUPAK extensible paper give you...

GREATER STRENGTH WITH LOWER TOTAL BASIS WEIGHT

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FARM CHEMICALS

Vol. 124 No. 3 March 1961

MARKETING

14 How Calchem Selects and Trains Its Marketing Personnel
M. E. Wierenga

MATERIALS HANDLING AND CUSTOM APPLICATION

18 What's Happening in Bulk Handling and Storage of Fertilizer?

TECHNICAL REVIEW

23 Plowdown Application Seals Anhydrous Ammonia in Soil
C. Loyal W. Swanson

PRODUCTION METHODS

28 Maintaining Quality Control at Shell Oil Co. of Canada's Simcoe Plant

SPECIAL REPORTS

12 Midwestern Agronomists, Industry Representatives at Chicago

22 Industry's Marketing "Goofs" in Serving the Home Gardener

32 Farmers Respond to Extension-Industry Cooperation
Gordon J. Ryder and Everett M. Rogers

MERCHANDISING AIDS AND PROMOTION

36 What the Manufacturer Can Do for the Dealer
Part II—Common Ground *F. E. Hartzler*

DEPARTMENTS

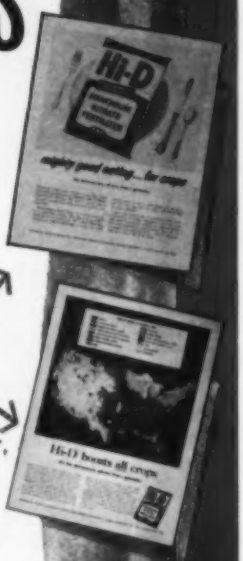
6 Washington Viewpoint
8 Letters
10 What's Doing in the Industry
40 Pest Reports *Jack Bongberg*
42 Patent Reviews *Melvin Nord*
44 News of the Industry
46 Chemicals
48 Associations and Meetings
48 Calendar
50 People
52 Reader Service
54 New and Noteworthy
58 Editorial: How we can save the "American System"

THE COVER STORY

From salesman to vice president and member of the Board of Directors of the Ortho Division of California Chemical Company in thirteen years! That's the record of this month's contributor to our marketing section—"Mel" Wierenga. Without the use of any "50 cent words," Mel very frankly shows you how they select and train their marketing people. Dr. Hector Lazo, moderator of the 1960 FCMS, referred to Mel's session as the "pragmatic approach"—but that didn't bother Mel at all. He went right on as though he had never heard of the academic term!

A BAGFUL OF WAYS TO BOOST Hi-D® SALES

IN '61 The idea of Hi-D is catching on. More farmers, more ranchers, more growers are using ammonium nitrate in granular form—using Hi-D as a supplement to your mixed fertilizers. Read how CSC is spreading the news about Hi-D and backing up your own sales efforts throughout '61.



MAGAZINES feature these informative ads, explaining the many advantages of Hi-D.

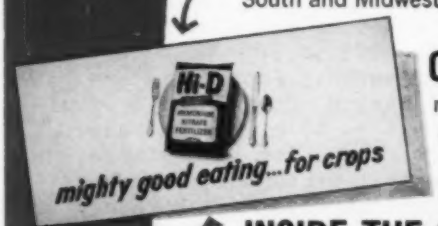
In full color in Progressive Farmer, Farm & Ranch and Successful Farming.

And in black and white in Florida Grower & Rancher, Prairie Farmer, Citrus & Vegetable Grower and Rice Journal.

TV SPOTS on farm programs of 18 stations demonstrate the free-flowing action of Hi-D.

RADIO SPOTS on 75 stations are a frequent nudge to farmer's memory.

BILLBOARDS in 879 high-traffic locations throughout South and Midwest enlarge 'Mighty Good Eating' theme.



OUTSIDE THE STORE Attractive metal sign and Hi-D clock-type thermometer (attention guaranteed!) bring the Hi-D buyer to your store.

INSIDE THE STORE Window streamers echo theme of 'Mighty Good Eating'; packages of samples, product folder and counter displays keep customers thinking Hi-D.

CSC

COMMERCIAL SOLVENTS CORPORATION, AGRICULTURAL CHEMICALS DEPARTMENT, ATLANTA, ARMOUR, ST. LOUIS, CHICAGO, NEW YORK

WASHINGTON VIEWPOINT

F
C

- *Incentives are planned to increase output of a number of crops and animals.*
- *Congress is expected to go along with $3 billion a year for Food for Peace.*

Farm production and the demand for farm chemicals are expected to increase — or at worst only taper off for a while sometime in the next several years — regardless of all the talk you hear about cutting back production. It's not that plans to cut back on some crops are not serious. It is just that there is simply more to the overall estimate of farm production and demand for chemicals than that offered by wheat and feed grains production.

Assuming that new legislation may offer some chance of a cutback in wheat and feed grain production — and this is still a very long shot — the new Administration is planning to offer every possible incentive to increase the production of a number of crops and animals. Behind this is high level strategy to go all out in food production as a weapon of defense.

Crops already known to be in short supply include soybeans. Cotton producers and the industry want an increase in allotments and say they need it. Authority has already been given for all-out sugar beet production. The incentives to increase dairy production will get a boost, one way or another, to get more dry-milk in the Food for Peace programs. Domestic school milk programs will get bigger. So will school lunch programs, with their capacity to take the slack out of fruit and vegetable markets. Food for the needy at home and food stamp plans will also play a small part in helping to keep up production.

Keeping up overall production will be emphasized, while every effort possible will be made to switch production patterns for a while. On the recommendation of the President's Food for Peace Committee, the Food for Peace Director already is calling for increased production of oils and fats, meats, butter, non-fat milk, soybeans, peas and other commodities classified by nutritionists as needed to "sustain adequate diets either for our needy in the United States or for the needy abroad."

The Peace Food Director called on USDA to provide edible oils over the next 18 months for distribution abroad by some 20 religious and humanitarian groups. The Department promptly scheduled 100 million pounds of vegetable oils for this purpose at one crack. The new Secretary of Agriculture already has plans under way to comply with a Peace Food request from the White House to "bring about shifts in production from wheat and corn into the oils and fats and protein foods needed for a nutritional diet."

Food for Peace wants $3 billion annually over the next five years. The outgoing agriculture secretary called for the same amount but was overruled by his Budget Bureau. The 1961 budget presented by the former administration called for $1.3 billion to carry out export deals considered possible before the present year is out. The new administration wants to raise this to $2 billion.

Congress is expected to go along with this to a large extent. Support is expected by legislators on both sides of the political aisles. Demand for agricultural production would be sustained by just that amount — $3 billion a year. Also behind the idea is that $3 billion a year is cheap compared to the more than $40 billion spent a year on the type of defense that protagonists in the cold war don't want to use in underdeveloped countries, anyway. High strategy sees uprisings in one underdeveloped country after another, sparked by hunger and Communist agitation. Introducing better systems of nutrition is calculated to make less fertile ground for infiltration by Iron Curtain economic forces.

The new name for the P.L. 480 programs — Food for Peace — also means you will hear less and less about "surplus" farm products. Pending a genuine thawing of the cold war, high farm production is here to stay. After a few years, even wheat and feed grains production might have to be given its head again as production analysts now see it.

Other signs that high demand isn't likely to slack off for some time include increased cash in the pocket and increased credit backing for farmers the rest of the year. Initially, increased financial resources made available to farmers

(Continued on page 38)

MICRONIZED

TRI-BASIC COPPER SULFATE

Copper fungicides offer many advantages—**Tri-Basic Copper Sulfate** can be used in spray or dust form on practically all truck crops and many fruit crops in the control of persistent fungus diseases—It is compatible with other pesticides and gives the added advantage of correcting nutritional deficiencies where there is insufficient copper in the soil.

Tennessee's **Tri-Basic Copper Sulfate** is micronized to a mean particle size of 0.5 micron to give greater covering power—It is guaranteed to contain 53% copper as metallic.

Insist on TC Micronized Tri-Basic Copper Sulfate

For samples or literature, make request on your firm's letterhead.

TC TENNESSEE CORPORATION
612-629 GRANT BUILDING, ATLANTA 3, GEORGIA

LETTERS

LIQUID ARTICLE STILL BEING READ

Edinburg, Tex.

In the April 1959 issue of FARM CHEMICALS magazine, you had an article by Peter C. Crolius entitled "Complete Liquids: Increase and Uncertainty."

In this article, Mr. Crolius had a chart showing the percentage of increase of liquid fertilizers vs dry fertilizers. I need the comparison for the years 58-59 and also the estimated number of liquid fertilizer plants in the United States as of now or some time during 1960.

We are in the manufacture of liquid fertilizers and use this information in meetings with growers as we attempt to tell the liquid fertilizer story to farmers in South Texas.

I would sincerely appreciate receiving this information at your very earliest convenience, inasmuch as we have another fertilizer show in approximately ten days.

Yours very truly,
JIM MILLER
Sales Manager
TIDE PRODUCTS, INC.

MAGAZINE SUPPORT APPRECIATED

Palmetto, Fla.

A little over a year ago, when the International Minerals & Chemical Corp. held a sales clinic in Tampa for the benefit of fertilizer companies and dealers in this area of Florida, Mr. Ed M. Reeder, salesman for this company, attended the meeting. It was the first such meeting that had been held in this area and was well attended and very beneficial to the salesmen attending, and to the companies represented by them. Shortly thereafter there appeared on your cover a picture of Mr. Reeder engaged in conversation with one of the International Minerals & Chemicals Corporation men that were conducting the sales clinic. Quite naturally, Mr. Reeder was highly pleased and so was this company, by reason of the publicity that we received at that time.

Another such meeting was held this year in Tampa also, but we were not fortunate enough to receive the same sort of generous publicity as we did receive at the first meeting. I do want to say that we are very grateful for the courtesy shown us even though the publicity thus received by us was just another means that the FARM CHEMICALS employed in giving publicity to the forward movement in the fertilizer industry and not for the purpose of giving any private publicity to anyone.

J. E. B. ASBELL
President
PRODUCERS SUPPLY, INC.

MORE HELP ON THE WAY!

Vincennes, Ind.

I have read with great interest some of your articles such as "How We Measure Profits," November 1960 and frequently find very helpful and constructive ideas pertaining to my end of the fertilizer industry.

There are two phases of the industry that I would like to have additional information on, they are *inventory control* and *depreciation*. I am certain that there are others who could use information on the same two subjects.

Inventory Control

The average percent of gross profit and the annual turn over of inventory is important but I am also interested in the loss that seems to happen each time that a bin is completely emptied. Are there any standard amounts that could or should be written off as each car is placed into inventory? What is the best means of keeping an accurate running inventory? These are but two of the questions pertaining to inventory control that I have.

Depreciation

What is the average life of various equipment such as mixing equipment, elevators and material moving equipment, trucks and spreader beds, and other plant equipment and what would be a standard write off for such equipment? I have found that the life of equipment used around fertilizer is not as long as the same equipment would last if used in other industries that I have studied.

If you have had any articles in your publications in the past that deal with any of the above questions I would appreciate getting copies of such articles.

Respectfully,
D. H. ELLIOTT
Accountant
LIQUILIZER CORPORATION

Author Hartzler will soon be starting a series of articles on control—how to control seasonal merchandise. Thanks for the fine remarks about our articles. —EDITOR.

BEST WISHES FROM NAC

THIS IS NATIONAL AGRIC CHEMICALS ASSOCIATION IN WASHINGTON
WA 658
TO ED MEISTER AND THE FARM CHEMICALS STAFF
CONGRATULATIONS AND BEST WISHES FOR SUCCESS ON THE NEW VENTURE IN PUBLISHING FROM ALL OF US ON THE STAFF OF NACA
L S HITCHNER
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"USE WITH CONFIDENCE"

A NATURAL QUALITY PRODUCT

TAKO

Airfloated: Bagged or Bulk

Guaranteed less 1% free moisture

QUALITY & SERVICE SINCE 1939

A NATURAL HIGH GRADE COLLOIDAL KAOLINITIC KAOLIN

"TAKO"—Airfloated Natural Colloidal Kaolinitic Kaolin, Insecticide Grade, is practically a chemically pure natural colloid with exceptional qualities that give increased workability in formulations, its purity is highly desirable due to its compatibility with other chemicals. Excels as a wettable powder—carrier-diluent. "COSTS SO LITTLE—DOES SO MUCH". Used in very large tonnage year after year.

NON-ABRASIVE NON-HYGROSCOPIC NON-CAKING FREE-FLOWING

Shipping Point: Plants: Hackleburg, Alabama

THE THOMAS ALABAMA KAOLIN COMPANY
2412 KEN OAK ROAD, BALTIMORE 9, MARYLAND
IT WILL PAY YOU TO INVESTIGATE "TAKO" FOR YOUR REQUIREMENTS

Uniform Quality
Prompt Shipments

How Union-Camp's 5-Star Plan saved multiwall bag user over $130,000 a year

Making things the same can sometimes make a whale of a difference. Particularly in a multiwall bagging operation. The Smith-Douglass Company, Inc., of Norfolk, Virginia proved it recently when they put Union-Camp's 5-Star Plan into action. The difference—in annual packaging savings—came to over $130,000 a year!

Standardize = Economize

Initial 5-Star Plan surveys at Smith-Douglass' six plants revealed that *standardization* held the key to major cost reductions. Three plants used sewn open-mouth multiwall bags. One used sewn valve bags. The remaining two plants used both types of bags.

Union-Camp's multiwall specialists showed that $30,000 a year could be saved by converting all six plants to sewn open-mouth bags and using open-mouth bag filling machines.

5-Star Plan in action. Plant surveys made by Union-Camp multiwall specialists paved the way for the major packaging savings described here.

That was only the beginning. By carrying the change-over one step further, and standardizing on *size* and *construction* of multiwall bags, the company would save another $22,000 a year.

1 Design Replaces 160

Next, Union-Camp's survey team analyzed the company's existing bag *designs*. They found there were about 160 designs being used. Here, again, standardization was recommended.

By creating one basic design, eliminating an expensive yellow outer sheet, and using the same printing copy for all bags, the company netted additional economies of $84,000 a year.

$30,000 plus $20,000 plus $84,000. Total annual packaging savings—$134,000.

$30,000 a year savings resulted from converting to sewn open-mouth multiwalls in company's six plants.

How Much Could You Save?

Hundreds of companies—large and small—reduce their multiwall packaging costs by taking advantage of Union-Camp's 5-Star Plan. This comprehensive service is free. It covers bag design, bag construction, specifications control, packaging machinery and a survey of your materials handling operation. An improvement in any one of these areas conceivably could result in substantial economies for you.

See your local Union-Camp man for complete details.

This basic bag design, now used for all Smith-Douglass brands, reduced company's multiwall costs by $84,000.

FREE 16-PAGE BOOKLET

Write Dept. M-4 today for a free copy of Union-Camp's new 5-Star Plan booklet. It describes many case histories showing how packers like yourself have achieved greater efficiency and economy in their multiwall packaging operations.

UNION-CAMP
MULTIWALL BAGS
Union Bag-Camp Paper Corporation 233 Broadway N.Y. 7, N.Y.

WHAT'S DOING IN THE INDUSTRY

F C

Foremost Food & Chemical Co. has entered the chemical field with completion of a nitrogen plant at Oakland, Calif. The firm is a wholly-owned subsidiary of Foremost Dairies, Inc.

Davison recently closed one mine in Florida and expanded and modernized another. Modernization of the Bonny Lake mine at Ridgewood, Fla., by the W. R. Grace Davison Chemical Div. followed closing of the Davison Pauway No. 4 mine near Lakeland, Fla., after almost 40 years of operation. A unique feature of the Pauway No. 4 operation was rehabilitation of an area of mined-out land on the outskirts of Lakeland. Dredging, filling and other landscaping was done to transform the area into a residential subdivision, complete with artificial lakes.

New manufacturing manager of Armour Agricultural Chemical Co.'s Nitrogen-Phosphate Div. is Frank Dunbar of Atlanta. With the company since 1934, he had been assistant general superintendent. H. E. Maune is project manager of the new ammonia and complex fertilizer plant to be built near Sheffield, Ala., and will be plant manager when construction is completed. Grant F. Davis becomes manager of the Crystal City, Mo., plant, succeeding Maune.

This is the month for the annual California Fertilizer Conference. To feature micro-nutrients and nitrogen, the conference will be held on the Kellogg-Voorhis Campus of California State Polytechnic College in Pomona, March 27 and 28. Formal papers will be presented by University of California technicians during the morning session on the 27th. A panel, moderated by Mordy Rose of the J. F. Sloan Co., will discuss micro-nutrients in the afternoon. R. L. Luckhardt, Collier Carbon and Chemical Corp., will moderate a panel on nitrogen the morning of the 28th. A banquet and outdoor barbecue also are planned.

Federal Chemical has appointed managers for its newly acquired Whitewater, Wis., plant. Roland Winter becomes division sales manager and James Edwards, production manager.

U. S. Phosphoric Products, Division Tennessee Corporation, has expanded its technical service with appointment of Owen A. Niles, Jr., as technical service representative. He will serve the New England and Mid Atlantic states.

Fire consumed the Swift & Co. plant in El Centro, Calif., on January 26, we read in a California newspaper. Stores of ammonium phosphate and ammonium nitrate were destroyed, and damage was estimated at $50,000. Several farm laborers were booked for investigation of arson.

The first school for training in pest control has been formed in Chicago. Known as the Elston School of Pest Control, it offers correspondence and residence instruction in all phases of structural pest control. Dr. J. J. Davis, former head of the department of entomology at Purdue, is director of the school.

After a major fire last April, Planters Fertilizer & Soybean Co., Pine Bluff, Ark., reports it will be back in production well before the 1961 season. A new storage building—300' x 150' and granulation equipment have been completed, and more loading facilities and a second bagging unit will be in operation by spring. New equipment includes Tyler-Hummer vibrating screens, an Omega feeder, TVA ammoniator and Kraft automatic bagging units.

George Kerbey takes over as manager of the Fairfield Chemicals Dept., Food Machinery and Chemical Corp. He succeeds John Rodda, recently named assistant to the president of FMC. Rodda will direct activities of the firm's Washington, D. C. office. Kerbey was sales manager before his recent appointment.

Merger of Kraft Bag Corp. with St. Marys Kraft Corp. was effected Jan. 31. Kraft becomes The Kraft Bag Division of St. Marys Kraft Corporation, Subsidiary of Gilman Paper Co., 630 Fifth Avenue, New York City.

"Tell me again that part about 'you're beautiful'"

"You're beautiful because your colors are bright —and you're so loaded with that certain perfection Chase always gives!" "That certain perfection" is really a host of little details that Chase never overlooks. For instance, every Chase plant employs an "Ink Man," just to keep constant watch over hundreds of different hues, and to help Chase's skilled color-printing craftsmen put them to the very best use. All this so your products go to market in the most inviting way possible! As for *economy* and *utility*... these are an integral part of every Chase Bag. For facts about bags for any purpose, call your Chase Man, or write us.

CHASE BAG COMPANY
355 Lexington Avenue – New York 17, N. Y.
32 plants and sales offices coast to coast

MULTIWALLS • TEXTILE • PLASTIC AND LAMINATED BAGS • CONSUMER-SIZE PAPER BAGS AND OTHER PACKAGING MATERIALS

Among industry men who took part in a panel discussion during a meeting of the NPFI Midwest Fertilizer Materials Handling Work Group were H. H. Tucker, Sohio Chem. Co.; R. L. Balser, Spencer Chem. Co.; Harry L. Cook, Farm Bureau Coop. Ass'n.; Loren Johnson, U. S. Steel Corp.; R. L. Maxwell, GLF Soil Building Service. Not shown: Leonard Schrader, American Oil Co.

Midwestern agronomists, industry representatives told

Soil tests, demonstrations spur fertilizer sales

FEW "institutions" have done as well in so short a time as the Midwestern Agronomists — Fertilizer Representatives annual meeting that has been going on for thirteen years.

More than 700 agronomists and fertilizer representatives got together for their annual joint meeting February 16-17. Sponsored by the National Plant Food Institute, the meeting heard committee reports; elected R. L. Cook, head, soil science department at Michigan State University, chairman of the Midwestern Agronomists and listened to some outstanding addresses.

Cook succeeded M. B. Russell, head of the agronomy department at the University of Illinois, who became new chairman of the North Central Soils Research Committee. He succeeded W. H. Pierre, head of the department of agronomy of Iowa State University. Secretary is George Smith, chairman, department of soils, University of Missouri.

New chairman of the Midwestern Extension Agronomists is Joseph Stritzel, department of agronomy, Iowa State University. He succeeded Robert Bohannon, department of agronomy, Kansas State University.

"Opportunities for Profit" was the topic of Alan K. Kindle, chairman of the advisory committee on merchandising.

He commented on the Intensified Soil Fertility programs, noting that fertilizer consumption was increased as much as 40 per cent in one county through this program.

Dr. Herbert R. Albrecht, director of extension, Pennsylvania State University, discussed the teamwork between Extension and the Experiment Station system.

"It has lifted from our people the fear of starvation, even during the bleakest days of world conflict," he said.

In forecasting what to expect from Extension in the 60's he said:

"The Cooperative Extension Service has begun to set the pace for adjustments within our Colleges of Agriculture, which will provide us with the blueprints of our progress in the future."

"The programs will emphasize advanced management procedures, new departures in marketing, consumer education, public affairs and responsibilities, family living, and community developments," he predicted.

Dr. Marvin Beatty, extension soils specialist from the University of Wisconsin, reported that maximum returns from fertilizer use in the future will become increasingly dependent on the kind of soils being fertilized.

Intensive management and greater capital investments per acre are enabling farmers to obtain higher and higher yields on most crops, Beatty said.

As the use of land becomes more intensive, the properties of the soil are an increasingly important factor, he pointed out. All soils are not equally suited to intensive use for crops. Only a limited number of soils are capable of giving high yield responses to intensive management.

Beatty said that maps and reports from soil surveys can show the locations of soils responsive to various intensities of management. These maps can help locate areas having high potential for increased use of fertilizer.

"Good measurements or estimates of yields are a must for a sound farming program," he declared. "If farmers are going to adopt new fertilizers and management practices, they need to know how much it will increase their yields."

IMPORTANCE OF CREDIT

Douglas R. Graves, assistant vice president of Harris Trust & Savings Bank of Chicago, reported that still greater increases lie ahead as we substitute more capital and technology for labor. Agriculture, he noted, is becoming increasingly dependent for many factors of production, such as fertilizer, feed, machinery and livestock.

"Progress of this kind can be continued only if we have capable and well informed men on the farm, who are properly financed," he said. "We will need fewer farmers in the future, but they must be better farmers."

"Less land in Ohio will be devoted to the low income crops, with the possible entire elimination of such crops from the rotation," Dr. H. J. Mederski, Ohio State University agronomist, told the group.

Mederski said the availability of relatively low cost nitrogen fertilizer, "has to some extent freed the farmer from the necessity of growing legumes as a source of nitrogen and provided greater flexibility in the design of the cropping system."

Dr. John T. Pesek, Iowa State University agronomist, reported that yields of continuous corn have averaged about as high as rotation corn in tests at six University farms over the past six years, Pesek reported. Average yields at the six locations were 91 bushels per acre for rotation corn and 90 bushels for continuous corn.

Kansas farmers have increased their fertilizer use ten-fold since the end of World War II, Dr. Floyd W. Smith, Kansas State University, revealed.

Fertilizer use totaled 332,861 tons in the year ending June 30, 1960, compared to 33,200 tons in 1946-47.

A 42 percent increase in plant food use by Miami County, Ohio, farmers in the year ending June 30, 1960 was the result of a fertilizer demonstration program on corn and meadow crops in 1959 and 1960. The complete report by Drs. Gordon Ryder and Everett Rogers of Ohio State University begins on page 32.

The 1962 joint meeting will be held at the Edgewater Beach in Chicago, February 15-16.

(L. TO R.) COUNTY AGENT W. T. SMITH, MR. PAUL RATLIFF, MR. JIM PRESLEY AND ASST. COUNTY AGENT J. W. ARCHER EXAMINE THE QUALITY OF FINISHED CROP.

RECORD YIELD: 295 BUSHELS PER ACRE!

ORTHOCIDE Seed Protectant helps Mississippi farmer become 1960 World's Champion Corn Grower

1960's bumper crop was achieved in one measured acre by Paul Ratliff, of Baldwyn, Prentiss County, Mississippi—a state where the average yield is about 30 bushels to the acre. And under adverse conditions that would ordinarily be expected to reduce his yield! Abnormally wet, cold weather delayed planting a full six weeks. Later, severe drought brought no rain for 135 days. Yet, at harvest time there was almost 100 percent of erect-standing stalks — fully 60 percent with twin-ears, and generous, full-sized corn a good part of the second-ear growth. The hybrid corn seed that produced this record crop was treated with ORTHOCIDE Seed Protectant. ORTHOCIDE-treated seed has been used by Mr. Ratliff since 1957, and is supplied by the Louisiana Seed Company, Alexandria, La. Says the firm's Northern Mississippi manager, Mr. Jim Presley: "There's no question but that the treatment of the seed with ORTHOCIDE played a large part in the promotion of this bountiful yield."

How ORTHOCIDE Seed Protectants help insure higher yields. ORTHOCIDE Seed Protectants contain captan, to fight seed and soilborne diseases. They coat the seed and put added protection in the surrounding soil, to increase resistance during the vital period before and after germination. The result is greater emergence, vigorous growth, better stands.

Recommended for many different types of seed —including corn, sorghum, cotton and beans. All ORTHOCIDE Seed Protectants give uniform seed coating, and superior sticking qualities. Most of them are available for both Slurry and Dust treatment.

Champion corn crop is weighed and recorded under the supervision of Prentiss County Agent W. T. Smith, October 10, 1960.

ORTHO®

HELPING THE WORLD GROW BETTER

CALIFORNIA CHEMICAL COMPANY, ORTHO DIVISION.....Richmond, California • Washington, D.C. • Atlanta, Georgia

How Calchem SELECTS and TRAINS its marketing personnel

Selection of personnel can be no better than the information on which it was based, says this outstanding farm chemicals expert who rose from salesman to vice president of Ortho Division in 13 years.

Organizing for marketing action was the theme of the second annual Farm Chemicals Marketing Seminar (FCMS), sponsored by FARM CHEMICALS, *held in New York City last November 15-16.*

The seminar was a tremendous success.

This is the fourth article in the FCMS series, the purpose of which is to further explain the total marketing concept which has been adopted by so many successful farm chemicals concerns.

This month Ortho Division of the California Chemical Company, Richmond, California, takes the spotlight. Mel Wierenga, energetic vice president of Ortho, shows how to develop the kind of leadership needed for a dynamic marketing organization.

Before Mel was presented on the program, two experts from Don Scott Associates discussed these three specific subjects.

1) Defining the total job to be done and the individual jobs which go to make up the whole.

2) Re-assigning and/or recruiting the right men to do these jobs.

3) The reasons for and methods of establishing training programs to assure that the men assigned to various tasks are prepared to adequately carry out their responsibilities.

Thus it was Mel's job to show how these logical precepts were successfully applied to the marketing of farm chemicals.

WHAT are the most common reasons for Ortho's turning down job applicants in its sales department?

I answer this by saying that they just aren't qualified! We think they are not qualified to do the work we require of them—or they don't fit into our organization.

That's pretty general. Let's pin this down to an applicant who has been screened and now we are interviewing him personally. Why do we turn him down?

One of the reasons might be that he doesn't like to travel.

Another reason might be that his only attribute is: he "likes people."

Now what's wrong with that? Well, how many times have you heard that favorite expression, "I like people"? We find many times that a salesman likes them *too well.* He likes them so much that he doesn't get around to selling them!

Our selection and training experience brought us to the rather blunt evaluation that "if you hire a clod, you end up with a clod."

We are convinced that it's grossly unfair to the applicant and to the company to hire a man for a job for which he does not possess the intelligence and the capabilities!

Here at Ortho, as with most companies, we have a reluctance to act soon enough in replacing non-productive employees.

We're constantly trying to find a means of *early identification* of those newly-hired people who will not come up to our expectations.

On the average, it takes us about four years to make a decision on these terminations. I'm speaking of sales personnel now, rather than those employed in production, warehousing and so on.

One of the greatest mistakes we make in our company is to promote a good salesman to branch manager—which requiries *administrative duties.*

Another mistake we make is to promote within the marketing organization a loyal warehouse man to a position where he has *responsibilities for inventory control.*

SELECTING PERSONNEL

Selection of personnel can be no better than the information on which it was based.

It is imperative that reliable, factual information be obtained and that a decision be made *only on that basis*—not on feelings, impressions and emotions.

Our testing procedure is very involved and space will not permit a full discussion of it here.

We have our own guides for recruitment and selection of sales personnel—from whom we draw our future management personnel, for the most part.

Our evaluation process consists of patterned interviewing, preceded by testing of various kinds—including personality inventory, vocational interest tests and others. Not all tests are satisfactory.

For example, we've tried the Flanagan aptitude classification test, but didn't feel it was discriminatory enough. The Thurston temperament schedule is a personality type test that attempts to

M. E. WIERENGA

Condensed by Farm Chemicals from 1960 Farm Chemicals Marketing Seminar

measure factors that are active, vigorous, impulsive, dominant and so on. Again we felt that it did not distinguish between sales and non-sales type personality types.

The point I wish to make is that some work and others don't. You've got to use those methods which work best for your particular situation.

We use mental alertness tests in hiring people—from plant to warehouse—to research to sales.

We feel this is a better measure of what we are seeking in the applicant than the number of years of school completed.

But don't misunderstand that statement! We weigh education very highly.

We relate the standard mental alertness test to our own requirements.

WHAT ORTHO LOOKS FOR IN SALESMEN

Health and stamina necessary for the sustained effort and physical activity of the job of salesman are important factors at Ortho. As for age, we look for a mature mind, but young enough to make a career with the company.

We look for stability of character and steadiness of purpose. A pleasant, sincere personality and a favorable appearance are important. And, of course, the person must be able to express himself clearly and convincingly—with the tact it takes to keep customers satisfied.

We look for industry and drive and mental ability above the average of the people with whom he deals, a pattern of previous experience which shows progress and success—finally and, more important, a sincere and positive interest in *our kind* of selling!

Now let's take morale. The Ortho Division of California Chemical Co. has just participated in an employee opinion poll which covers some nineteen different operating companies of the Standard Oil family. Overall, Ortho rated more favorably and the marketing department of Ortho was above Ortho as a whole!

Now I might point out that in opinion polls of this nature, marketing people generally tend to rate their company more favorably than do non-sales personnel and this is just a small example of what an opinion poll is.

You have many reams of statistics, all of which can be checked and cross-checked, including the personal write-in comments which cannot be double-checked as to the author.

CONTROL OF PERSONNEL

Manpower justifications and follow-up at the end of the year in the annual appraisals thereafter, provide close control of sales personnel. Production, warehousing and clerical personnel are controlled by performance standards. Personnel are hired or released on the work load as measured by the standards.

A typical justification for a salesman is based on a prediction of sales and profits three years in advance. In other words, when we put on a new salesman, not only are the costs of the salesman proper involved, but also the cost increases in his home office as a result of his bringing in additional sales. This is what is termed as *full-cost basis*. When a salesman is replaced we use exactly the same procedure.

The annual appraisal indicates in every respect how the man is doing. We also use what is called a post employment inquiry or exit interview. Since starting this procedure approximately three or four years ago we have had 100 per cent returns. Confirming the many authorities, salary has not been the number one factor for departure. It's always a factor, but never number one.

HOW ORTHO IS SET UP

Ortho has district decentralization. In other words, each sales district is responsible for its own profit and loss statement. The districts have manufacturing plants and the district managers are responsible for those plants within their district.

Therefore, a district manager must know many things—including having a working knowledge of sales, accounting, manufacturing, etc.

As mentioned, each district has its own P & L set-up which keeps the district manager aware of costs of doing business, as well as controllable items of expense.

At all times he keeps in mind that he has the authority and responsibility, as well as *accountability*.

FLEXIBILITY IS THE KEY!

In my opinion, high morale comes about not because of job description as such, but rather because better management is possible by clearly defined activities, responsibility, authority and relationships. This would not be possible without these guides.

Another point brought out is greater flexibility. Greater flexibility is achieved, and has permitted us to handle effectively, a wide variety of products in marketing activities.

For example, as mentioned previously, our district manager is not only responsible for sales and profit results—but also for production and warehousing activities, credit activities, physical facilities including production facilities, personnel, salary administration within his district, inventory control, etc.

Flexibility enabled us to take on fertilizer on the west coast and achieve what we feel is a leading market position in three years since the building of our first plant.

Another point made is more security. Personnel increased in our organization from 350 to 1,500 in twelve years, with a ten-fold increase in sales.

MANAGEMENT GUIDES DO THE JOB

In some companies there's a lot of confusion concerning assignments. People are doubtful about the limits of their *responsibility*, *authority* and *accountability*.

Not so at Ortho. We have management guides covering all of the management positions, which define the duties, responsibilities and functions of the position—as well as the limits of the authority and accountability going with that position.

All other positions are covered with position descriptions of various types—all of which accomplish the same purpose.

Overlap of activities can cause some big headaches. The management guide helps solve this problem. Job descriptions clearly delineate the areas of responsibility and authority—both for the line and staff organizations.

In the last ten years employees have been provided with a package of benefits that compares favorably with the

How Calchem SELECTS and TRAINS *(Continued)*

best in the country. These are outlined in a series of booklets which we have entitled, "You and Your Company."

We have approximately 253 agricultural pesticide and fertilizer salesmen and about 70 garden and home salesmen. I'll discuss this relationship a little later. We have approximately 60 pesticide-fertilizer branch managers, about 13 garden and home branch managers and a number of sales supervisors.

You'll note that our sales effort is segregated as to our garden and home or small package dealer line from pesticides and fertilizers.

We now have more people in the marketing department than we had in the entire organization ten years ago!

Because of our expansion in personnel from 350 to 1,500 in a twelve-year period, promotions have occurred more rapidly than we would have liked and probably more rapidly than was good for the individual so treated. However, we were faced with the difficult choice of holding to a general policy of promoting from within or going outside. Now we recognize the advantages and disadvantages of this thinking, but felt that the challenge and the lift to the morale by pursuing a general policy of promoting from within outweighed the disadvantages.

We have gone outside in specific instances where personnel did not exist within our organization. I refer specifically to the advertising division for example—and, of course, when we established ourselves in the fertilizer industry, we needed some outside help.

Just as you have high and low producers in the marketing organization because of variations in ability, you have this same range in people's ability to teach. For this reason we use a combination of on-the-job training carried out by the immediate supervisor and group training activities in the form of clinics, seminars and outside instruction.

Within our own organization we have training sessions and sales clinics. We have training sessions for nearly all members of the marketing department, starting with the warehouse man clear up through the district management.

We have sales clinics where we start with basic principles and go through the entire routine clear through the point of sales training.

We use outside sales instruction in the sales trainee clinics and branch manager supervisory clinics. We attempt to keep our men in continual training; however, we try not to overdo it to the point where the recipient becomes bored by duplication and so on.

We carry out this training for the dealer, clerk level and for the distributor, salesman.

For example, in December and January all of our branch managers attended a training program designed primarily to help and instruct sales people through on-the-job training and through formal group discussions and sessions.

FOUR BASIC TRAINING STEPS

The most dependable method of instruction consists of four basic steps—prepare to learn, present the material, practice and apply learning, follow up and check results.

Now without a doubt, the first two are the easiest and the last two are the most difficult. From my experience, the thing I would stress most is practice, practice, practice and then practice some more until it becomes a habit. Instruction and training that falls short of establishing new habits fail in their purpose in my opinion. The only way you can find out whether training has resulted in practice is by the follow-up.

For example, on the follow-up, we use a supervisory check list. We also, of course, have a supplement for the marketing department to our regular appraisal form.

Our experience indicates that training involves a combination of the line organization and outside staff of specialists, but I am convinced that no training program will get off the ground unless it has the support and follow-up of the line organization.

FOUR MEASURES OF PERFORMANCE

In standards of performance, experts say there are only four measures of any performance—quantity of work, quality of work, cost of doing the work and the time it takes to do the work.

I'd like to make this observation. Now I might be willing to accept these as being the four measures of performance. But I want to say that we are concerned with more than performance in a man that we have represent us in the field. We are very much concerned with such matters as character, integrity, reliability, behavior on and off the job.

Now the experts might well argue that negative aspects in the areas I mention would necessarily influence one of the four measures of performance, but I do not think so. It has been our experience that a man lacking basic qualities of honesty and integrity can be an "expert" in alibing and covering up. It will be years before this fact is sufficiently known to say that it directly affected the performance in the four areas which they outline.

ORTHO'S APPRAISAL FORM

Now let me comment briefly on what we're doing as far as measuring these areas of quality, quantity, cost and time. I'm speaking again primarily of marketing personnel, principally the salesmen.

In our regular appraisal form we cover such matters as the estimated sales for the coming year. We indicate the potential that's available in the area. We put down goals with regard to the number of calls per day, the number of new accounts, the performance we expect with regard to credit and some idea of the profitability of this effort at the salesman's level.

At the end of the selling season the supervisor again sits down with the employee and performance is measured against the goals that were set. As a matter of fact, it makes it pretty easy for the employee to gauge his own performance and the supervisor can spend time discussing how he may develop into a more effective salesman.

Our salesmen are required to keep customer records which aid the supervisor in determining how effectively he routes himself, the size of the accounts he calls on, as well as those he is selling and those he is not selling.

We believe this gives us an excellent yardstick in measuring performance.

We have spelled out as much as practical the reaction and the results desired. Our form provides the strictest measure possible for all performance accomplished through the appraisal and development supplements we've added. Discussion of all these materials would be too detailed to include in this article.

The plan must be followed rigidly. The appraisal is annual—more often if the area or the person is questionable.

We must not lose sight of the fact that we are dealing with people who have strength or weaknesses such as all of us have. If by "rigidly" we mean in terms of what is desired as against procedure, I would be more inclined to accept that definition. We must recognize that we are constantly bringing new men into the management team. At first they have a reluctance to discuss these matters with employees and it takes some time for them to accommodate themselves to the new possibilities.

The result is the freedom to expand and I believe our record over the past twelve years speaks for itself.

"We've cut our customers' waiting time from two weeks to overnight," says MR. LES I. DAVIS, Manager.

NEW LEADER LIME-FERTILIZER REPORT

100 Acres a Day Per Rig, Almost No Downtime, Amazing Accuracy!

Simplot Soil Builders spread nearly 30,000 acres by offering overnight fertilizer and gypsum service to farmers in the Caldwell, Idaho area.

"Reliability is a strong point about New Leader," says Mr. Davis, "our shop records bear this out. They just seem to run on and on, requiring nothing more than routine lubrication, which the drivers take care of personally."

SIMPLE OPERATION

"Operating controls are very simple and easily accessible. Our experience has shown us that each quarter inch opening of the tailgate produces an application rate of 100 lbs. per acre, so for a typical rate of 400 lbs./acre, the operator need only set the opening to a height of 1 inch. The rate will be accurate within limits of plus or minus 2%. We did a 150 acre fertilizing job at a 400 lb./acre rate, normally calling for a total of 60,000 pounds of material, and actually used 59,640 pounds, an amazing degree of accuracy, considering all possible variables."

SAVES OPERATOR'S TIME

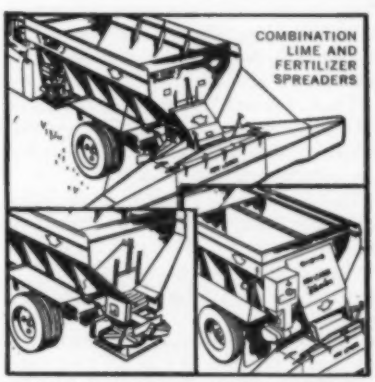
"Two other major advantages we gain with our New Leader spreaders are their twin distributor fans, which produce an equal spread on both sides of the truck; and the drive shaft-powered feed conveying of material onto the fans, which assures a set rate of application, regardless of vehicle speed. This drive varies the speed of the wide, flat belt in the bottom of the spreader in direct proportion to vehicle ground speed, so the material falls into the fans at a faster rate as the truck speeds up, and the flow slows down as the truck does.

"Since the fans are driven by a separate 7 h.p. engine, their speed remains constant, even though the truck speed may change, keeping the spreading width constant. This means our operators can work a consistent pattern in the field and don't have to vary their row spacing according to speed."

Using seven 10' 6" New Leader spreaders, Simplot Soil Builders serves a 50-mile radius from Caldwell, where the major crops are sugar beets, potatoes, grain, hops, hay, alfalfa, clover and grazing areas. Normal application rate is 300 to 1,000 pounds per acre, although they have spread as low as 100 lbs./acre and as high as one ton/acre. For alkaline soil, they frequently spread gypsum anywhere from 500 to 4,000 lbs./acre.

"Our New Leader spreaders produce a markedly superior uniformity of application, whether the product is dense or light, and our farmer customers are thoroughly satisfied with the results they produce."

See Your NEW LEADER/MAN For One of 12 Rigs Built For Your Area's Specialty. Authorized Service—Genuine New Leader Parts.



Got a lime-fertilizer spreading or selling problem? Write for an answer, today!

NEW LEADER

THE FASTEST SPREADING NAME IN ALL 50 STATES

HIGHWAY EQUIPMENT COMPANY
633 "D" Avenue, N. W., Cedar Rapids, Iowa

☐ Send me a copy of "How to Sell Lime and Fertilizer" and the name of the nearest NEW LEADER/MAN.

NAME _____

COMPANY NAME _____

ADDRESS _____

CITY _____ STATE _____

PHONE _____

Loren R. Johnson describes USS scale model and flow chart.

What's happening in BULK HANDLING AND STORAGE *of fertilizers?*

IF a dry fertilizer mixer is concerned about the bulk blender putting him out of business "the faster he can set up his dealers to "go bulk" the better off he'll be.

That's the word FARM CHEMICALS received from several large midwest fertilizer manufacturers last month in preparing this special report.

Bulk spreading is growing in popularity throughout the country. One reason for the popularity of the system in the northeast is that about 90 per cent of the lime spreading business is now bulk.

Rod Maxwell, Grange League Federation, was reached by FARM CHEMICALS as he was visiting farms around Bath, New York. He said:

"A farmer can save up to $4 a ton using bulk handling if he uses the proper equipment and services available."

He added that about 30 per cent of GLF's fertilizer business is now bulk. He said that the lime spreading business works in well with fertilizer spreading. Thus "the trend will be toward bulk handling and storage in the years to come."

In an effort to place labor-saving equipment within the reach of all farmers, agricultural colleges are cooperating with equipment concerns to make fertilizer spreading more efficient.

That's one of the major problems standing in the way of bulk handling and storage today.

RESEARCH PROJECT AT VPI

Floyd Cunningham, agricultural engineer at Virginia Polytechnic Institute, is designing and building test equipment in a special project at that institution. A bulk spreader truck with the latest equipment has been loaned by a commercial firm for the research.

This truck is equipped with auger booms and spinners, and is compartmented so that materials can be mixed while being spread.

It even has spray equipment for applying nitrogen solutions.

Several factors can influence the uniformity of the spread of fertilizer across the swath, Cunningham says. Some of these are 1) slope of the land, 2) smoothness of land, 3) speed of the truck, 4) mechanical condition of the fertilizer etc.

He has devised a collector which can be placed under the boom in the shop. With the truck jacked up and running, this collector will help determine how even the fertilizer is spread across the swath. Cunningham may use a hydraulic cylinder to simulate bumps which at times influence metering and distribution of fertilizer.

Cost of modern bulk spreading equipment varies from $1,600 for the regular lime-type spreader to approximately $4,000 for the compartmented spreader similar to the type Cunningham is testing.

LIQUID INDUSTRY SPURS BULK SYSTEM

It has been said that the dry fertilizer people didn't do much thinking about developing better ways of handling and storing fertilizer until the liquid industry (and as we pointed out earlier, bulk blending) really got moving.

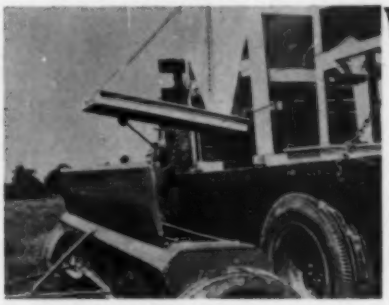
But even now bulk handling is moving entirely too slowly for its strong boosters, who say:

"Bulk fertilizer service is a natural."

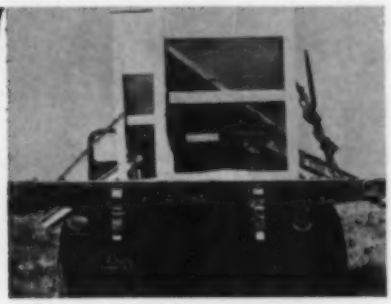
Take Eastern States Farmers' Exchange, Inc. as an example. Last spring they reported that hundreds of their members were handling bulk fertilizer.

Eastern States fertilizer service personnel had studied the future of complete liquids and came to the conclusion that "liquids will have only a small role in northeastern agriculture."

Pneumatic system unloads bulk material from hopper bottom car into delivery truck.



Fertilizer distributor in position for loading from bulk bins or flatbed truck.



Steel bulk bins are secured on flatbed truck.

The report added that considering economy, production, storage, application convenience and service . . . they found that for the northeastern farmer "bulk dry-mixed fertilizers are the thing for the present and the future."

Bulk dry applications are showing important advances every year, but there are still many important barriers to progress. Some of these are 1) lack of promotion, 2) lack of cost studies, 3) inefficient spreading, 4) soil compaction, etc. Let's take a couple of these for discussion.

EASTERN STATES COMPILES INFORMATION

Eastern States has been compiling and disseminating results of their cost studies for some time now. And it's paying off for them. The cooperative reports:

"Bulk fertilizer service costs are compared with the costs of fertilizer taken in 80-lb. paper bags, and there are some definite economies involved when dry-mixed fertilizer is requested."

Although savings of $2 to $3.25 and upwards are generally passed on to the farmer, according to people quizzed by FARM CHEMICALS, it does not seem to be as strong a promotion point as other factors. Eastern States used a variety of methods last year to increase bulk spreading. Perhaps their greatest asset was their "auxiliary service representative."

Arrangements have been made with men who are in the lime and fertilizer spreading business. One auxiliary service representative will serve several "service centers" and local representative areas.

"If an auxiliary service representative is used to custom apply the bulk fertilizer on the field, it can cost from 25 cents to $1 per acre over the cost of bagged fertilizer still piled up on the barn floor. Very few farmers can apply via the paper bag method for these cost differences."

Thus Eastern States has the "figures" to show farmers how much money they save, but it is the consensus of many that even greater factors than savings are the magic words . . . "ease of handling, convenience, labor-saving!"

As farm units get larger, labor becomes scarcer, and more machinery becomes available, the "fact of life" companies serving agriculture must observe is that farmers are going to demand easier, more convenient and economical methods of handling fertilizer.

TOTE BOXES GOOD PROMOTION

Rod Maxwell of GLF told FARM CHEMICALS that they make good use of "tote boxes" which are made of exterior grade plywood and hold about 2500 pounds of fertilizer. They are durable and about six of these boxes fit on a farmer's truck.

Stores display them in their windows and report from "poor to excellent results in attracting farmers' attention to bulk handling.

They are now looking into the possibilities of using steel bins.

Active in the bulk handling and storage of fertilizers in the mid-west are such companies as Spencer Chemical, Smith-Douglass, F. S. Royster Guano Co., Swift, and Michiana Chemical.

Large operations in the west are Anchor, Simplot, California Chemical, Collier and Cominco.

TWIN STORAGE TANKS

Spencer Chemical Company has twin overhead storage units at their warehouse points in Lawrence, Kansas, and Marion, Illinois. Each twin has a 34-ton capacity. Fertilizer flows on a portable belt conveyor from a hopper bottom railroad car in stainless steel buckets to overhead storage. A 6-ton truck can be loaded out in 15-20 minutes with minimum spillage by a "part-time" man, a Spencer spokesman told FARM CHEMICALS.

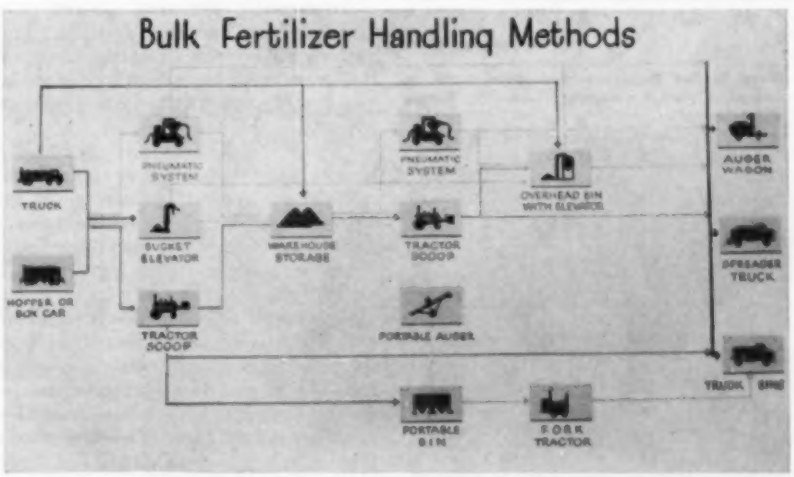
Cost of the Butler twin-unit, made of bolted, corrugated mild steel with epoxy linings, is $7,500.

Spencer tests show, after five months' storage, ammonium nitrate has suffered less than 1 per cent pick up of moisture.

Systems employed by other companies across the country are featured in the photos on these pages. Also shown is a flow chart prepared by U. S. Steel Corporation's market development department.

Loren R. Johnson, agronomist for U. S. Steel, told FARM CHEMICALS:

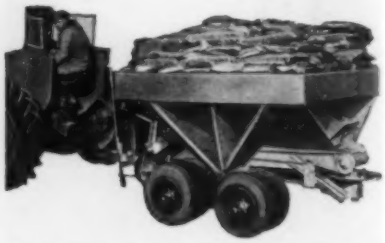
"The most efficient system will vary according to warehouse design, loading



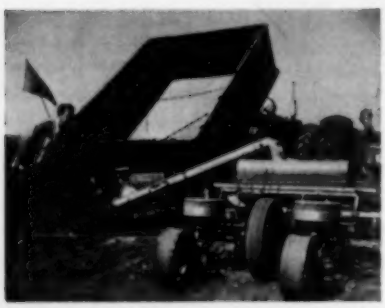
MATERIALS HANDLING
CUSTOM APPLICATION *(continued)*

Belt Bottom Transport unloads fertilizer into fan-type distributor manufactured by Sam Killebrew, Inc. The distributor is equipped with a sloping, vibrating floor section which moves fertilizer to rear spreader fan.

Fan-type fertilizer distributor.



8 Wheel Model N-48 fertilizer spreader is offered by Simonsen Mfg. Co.



Portable auger manufactured by Knoedler Mfg. Co. fills new type John Deere corn planter.

"New Leader" fertilizer spreader shown above in operation is produced by Highway Equipment.

Here is the twin overhead storage unit at Spencer Chemical Company's Lawrence, Kansas warehouse point.

facilities, access to loading docks, and the requirements of the dealer to deliver the necessary tons of fertilizer to his customers in the specified amount of time."

The agronomist is chairman of the Fertilizer Handling Work Group of the NPFI Midwest Research and Education Committee. He added that equipment needed for the specific bulk handling job varies greatly with the different methods of fertilizing crops in various areas, different sized farms and types of farms.

Tractor equipped with bucket is the most common piece of equipment used by the dealer or distributor. Various industrial tractors with large buckets to ordinary farm tractors with 500-lb. capacity buckets are available.

Elevator, auger or conveyor systems may vary from a simple grain-type auger which is set in the fertilizer pile to load trucks—to an elaborate elevator and conveyor system consisting of an under-track hopper bottom railroad car unloader, bucket elevator (for lifting), horizontal conveyor system and overhead hopper storage for gravity unloading of fertilizers.

Pneumatic systems are not now common for handling fertilizer but various air systems involving the positive pressure or vacuum principle are in use for handling bulk farm products like grains and feeds.

"Since fertilizers are ordinarily heavier (45-70 pounds per cubic foot) and more corrosive, greater power requirements and corrosive resistant steels will be necessary for handling fertilizers, but this can usually be rectified," said Johnson.

Common practice when bulk fertilizer is available is for the dealer to load it on the farmer's grain-tight wagon or truck box. The farmer then buckets or scoops the fertilizer into his application equipment in the field. More efficient methods for the farmer to handle bulk fertilizers would include: bulk spreader trucks, auger or self-unloading wagons, and portable gravity unloading bins. Bins of various designs and capacity are being used, notably in the west.

FARM CHEMICALS has learned of a spreading service in Scotland which has bins on legs, which fold so that the bins can be loaded on a truck, hauled to the farm, the legs folded down and the bins raised and left for the farmer to load his spreader. Or the spreading service may be furnished by a fertilizer company.

Loading can be done by fertilizer companies with a minimum of delay. In some cases, the report says, this has involved the erection of large overhead hoppers giving sufficient headroom for the bins to be loaded without being removed from the truck.

Bulk handling equipment companies are really trying to outdo each other with new innovations in this fast-growing field.

The auger wagon, for instance, is a useful piece of equipment on any livestock-grain farm. It is also being designed to handle fertilizers. It can be filled at the dealer point, pulled to the field and used to fill almost any type of fertilizer application equipment. In addition to fertilizers, an auger wagon can be used for handling grain and feed for year 'round use.

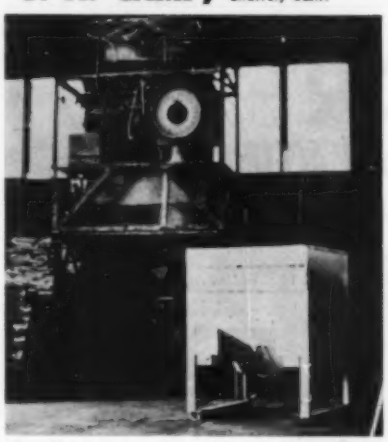
Knoedler Manufacturers, Inc., Streator, Ill, has a "quick attach" tail-gate auger which converts any hoist-equipped farm wagon or truck for auger unloading of pellet fertilizer. It will handle 300 lbs. of fertilizer per minute.

Knoedler also has an auger wagon that is virtually a portable bin. It can also be used for filling feeders, transporting grain, seed and other materials.

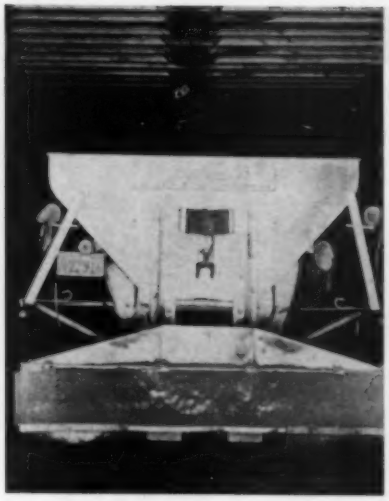
The Belt Corporation, Orient, Ohio is featuring its "Brod-Kaster" which spreads pelleted and granular fertilizer approximately 50 feet wide. It's said to give a uniform pattern which blends at swath edges for proper material placement. Another advantage is it's said to get into fields when trucks cannot.

Bulk handling across the Country

S. A. CAMP, *Shafter, Calif.*



Overhead automatic batch weigher fills bins.



EASTERN STATES

Steel bulk bins on loading dock at Eastern States Farmers' Exchange installation.

POLK, *Haines City, Fla.*

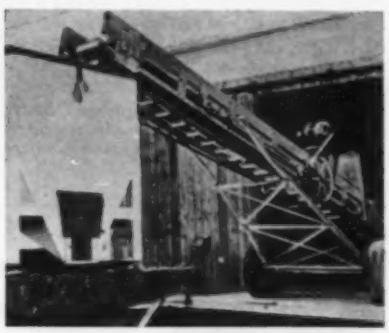
Hydraulic side dump Bulk-Hauler transport manufactured by Sam Killebrew, Inc., is used by Polk County Fertilizer Co. Each bucket has capacity for 6½ cubic yards.

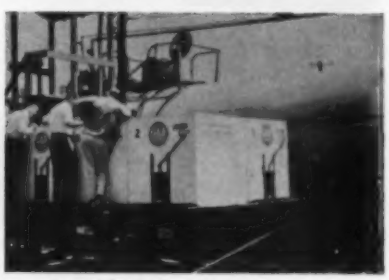
TRIANGLE CO., *Oxnard, Calif.*

At far left is 300 ton overhead wooden storage bin. It has 10" unloading shoots equipped with bucket elevator for unloading trucks into bin. Bulk truck ready for loading is shown at left. A six ton spreader truck can be loaded in 1½ minutes from the overhead storage bin.

G. L. F., *West Winfield, N. Y.*

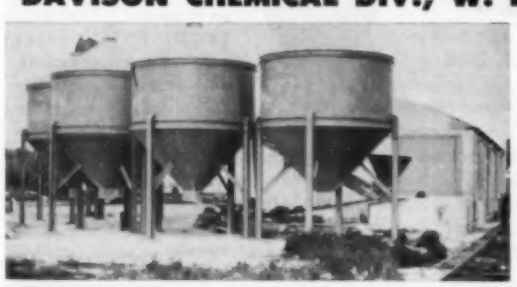
Tractor scoop (above) dumps fertilizer into elevator to fill bin (below) outside dealer's building.





Wooden bulk bins on a loading dock at G.L.F. in Union City, Pa.

DAVISON CHEMICAL DIV., W. R. GRACE, *Wakarusa, Ind.*



Bulk storage fertilizer tanks are arranged in a circle so that they can be loaded with one elevator as shown at right. Tractor scoop drives into boxcars from loading ramp and drops fertilizer into hopper on elevator shown.

County agent points out industry's

marketing "goofs"

in serving the home gardener

By HOWARD H. CAMPBELL*

In his talk before the recent Northeastern Weed Control Conference, Howard H. Campbell—county agricultural agent in Nassau County, New York—emphasized that his comments were based not only on his own observations, but also on those of his associates. He added that the views that he was about to express also reflected the ideas and suggestions of other county agents who now work in urban settings in the northeast. Following are highlights of Campbell's suggestions.

*County agricultural agent, Nassau County, New York. Condensed from a talk presented before Northeastern Weed Control Conference, January 4, 1961.

FOR establishing new lawns, I would like to describe a possible material which I believe our homeowners would appreciate being able to purchase. We need a material which:

(1) Will kill weed seeds and residual grass plants to a depth of at least six inches.

(2) Will disappear from the soil in a short period.

(3) Will be effective at lower soil temperatures in order to allow more early spring seedings.

(4) Will be non-toxic to humans and pets, have a desirable odor and be easy to apply.

APPLICATION PROBLEMS DISCUSSED

Getting homeowners to apply materials at the proper rate is a problem for everybody, the research men, county agents, manufacturers and homeowners.

If materials are not applied properly, our efforts are cooperatively wasted. If you want to see a sight in the spring, take a ride around the developments in Nassau County and observed the striped landscape. You can find almost any design of modern art on lawns caused by a nitrogen response or nitrogen injury.

If weed killers are applied as haphazardly as our fertilizers, I wonder sometimes if anyone is getting satisfactory results.

Our homeowners may be precision drivers at 50 miles per hour, but when they are slowed down to 2 to 3 miles per hour behind a lawn spreader, they are in a new world.

We spend years researching and teaching, then send a home gardener across his lawn without proper direction. He very often does not know what he has covered or if he has covered an area at all.

So why not color our herbicides so that the homeowner will treat once and not twice or not at all. You may think this point is not important, but you are

(Continued on page 56)

BELT BROD-KASTOR

Applies fertilizer FAST and ACCURATELY

HELPS YOU SELL MORE PELLETED AND GRANULAR FERTILIZER!

A NEW MACHINE... A NEW WAY TO SAVE TIME, MONEY, AND LABOR!

SERIES BBKWR
With Exclusive Swing-out Fans for ACCURATE Rate Adjustment before Field Operation!

Costs Only Small Fraction of Truck Spreader!

Now — spread pelleted or granular fertilizers as much as 4 times faster than with conventional equipment. The Belt BROD-KASTOR saves your time, reduces labor, and makes more efficient use of valuable fertilizer. Attaches to any tractor. PTO drive. Over 1800 lb. hopper capacity. Exclusive vibrating hopper bottom assures continuous flow of materials. Spreads in swaths fifty feet wide, and more. Positive off-on control from tractor seat. Trouble-free, sturdy, quality steel construction.

Exclusive Radial Adjustment over Widely Spaced Fans for ACCURATE Placement on 50 Ft. Swath!

Stainless steel parts, high speed fans at each end of hopper provide wide, even material placement. Pattern edges blend to assure uniform coverage. Covers maximum area in minimum time.

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BELT THE BELT CORPORATION, ORIENT, OHIO

FIGURE 1. Hose attachment for releasing ammonia under the furrow slice.

PLOWDOWN APPLICATION

seals anhydrous ammonia in soil

By C. LOYAL W. SWANSON*

RESEARCH sponsored by Texaco Inc. at the University of Illinois shows that plowdown application of anhydrous ammonia securely seals anhydrous ammonia in soils.

M. R. Smith, graduate student, and B. J. Butler of the University's department of agricultural engineering recently completed a study of techniques for applying anhydrous ammonia with a moldboard plow applicator. When properly applied, losses have been proven to be insignificant.

APPLICATION TECHNIQUES

Zones of ammonia distribution in the soil were studied for three depths of plowing, three lengths of applicator hose, and three different lateral positions under the furrow slice in Drummer silty clay loam and Brenton silt loam. The manner of attachment of the applicator hose to the plow is shown in Figure 1.

As is true with any other farm operation, a good job of plowing down anhydrous ammonia gives maximum returns. The following figures developed from research trials by Messrs. Smith and Butler, show how plowdown anhydrous can be best applied. Application rates behind one plow bottom were as high as 150 pounds per acre.

Little loss of ammonia occurred at the proper application depth (Figure 2). Losses from plowdown of anhydrous ammonia were much less than the usual expected losses which occur in the handling of materials. Average losses were 1.04 per cent for the 3-inch plowing depth, 0.35 per cent for the 6-inch depth and 0.15 per cent for the 9-inch depth.

About 90 per cent of the loss that did occur (less than 0.5 lbs/A) took place the first half hour, and 97 per cent the first hour. Apparently, the loosened plowed soil is a factor in the rapid absorption of ammonia (Figure 3).

When ammonia is applied under a furrow slice, it immediately comes in contact with a considerable volume of loose soil, This increases the soil surface area available for absorption of the ammonia. A neutral indicator-gypsum suspension sprayed across vertical sections of the furrow slice outlined the absorption zone in color. (The pattern of this absorption area is shown in Figure 4.)

LATERAL DISTRIBUTION

Too near the surface the soil is too loose for best ammonia absorption. Too much upward movement of ammonia

(Please turn page)

Texaco Inc.—Chicago, Illinois.

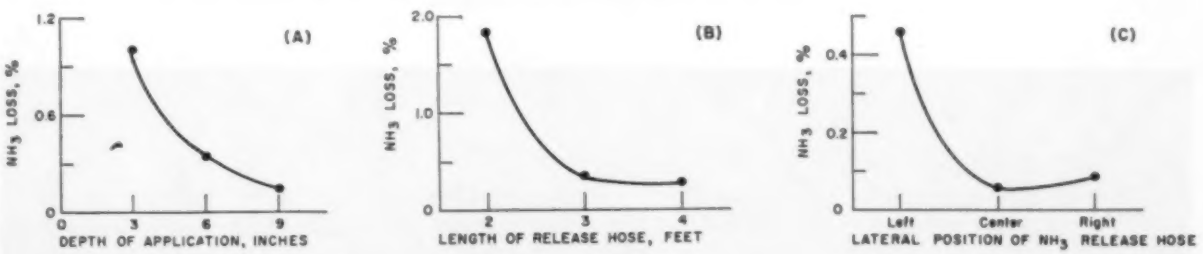
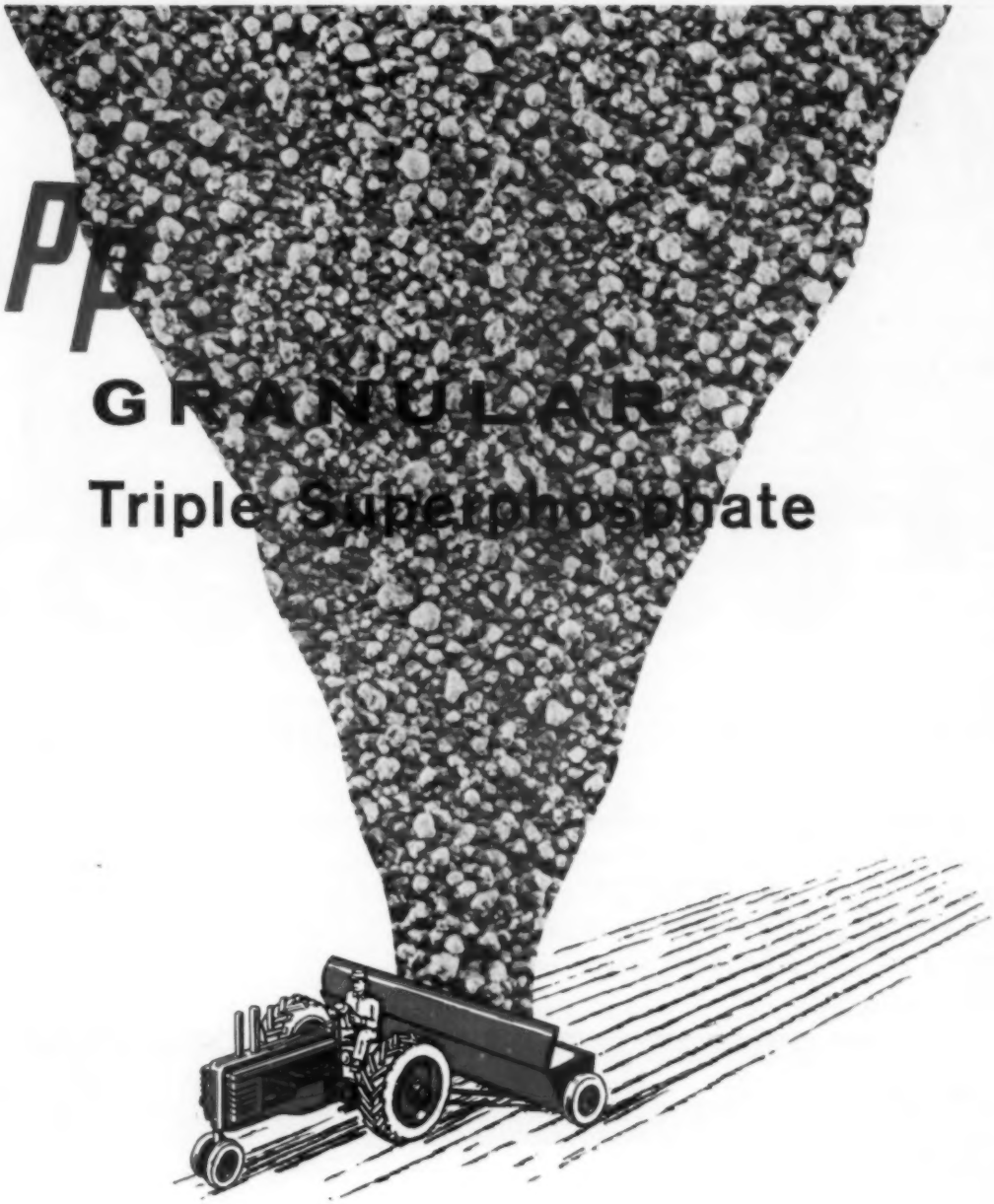


FIGURE 2. EFFECT OF POINT OF NH_3 RELEASE VARIATION ON NH_3 LOSS.

Wet Process Acid of Highest Quality
52-54% P_2O_5
Solids less than 1% by weight

Headquarters For ALL Phosphates Used In High Analysis Fertilizers



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Plowdown Application *(Continued)*

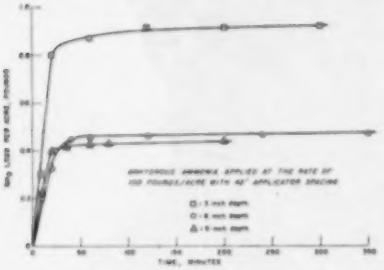


FIGURE 3. RATE OF AMMONIA LOSS AFTER APPLICATION

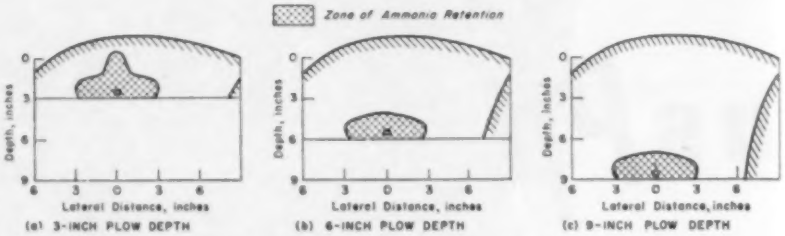


FIGURE 4. EFFECT OF APPLICATION DEPTH ON AMMONIA DISTRIBUTION

occurs. At the 6-and-9-inch depths the absorption pattern is elliptical with little downward movement into the plow sole. This lateral distribution is beneficial in several ways:

(1) The ammonia is placed in closer contact with the plowed-under crop residues, thus promoting their rapid decay.

(2) Nitrogen is available to a larger root area of the succeeding crop.

(3) The increased surface area of the soil has the capacity to absorb more ammonia.

(4) During the crop growing season the nitrates produced by nitrification of the ammonia will be absorbed by the larger root area, preventing leaching of the nitrates.

(5) Deeper placement with lateral distribution encourages a deeper root system with greater drought resistance.

The lateral positions of the release hose used in this study are shown schematically in Figure 5.

The zones of ammonia retention show that the hoses should be trailed under the furrow slice at least 4 inches from the furrow wall. At this position, the hose is under the bulk of the overturned furrow slice (Figure 6).

At the cleavage area between furrow slices, the ammonia has a more direct escape route to the atmosphere. This loss is less than 0.5 per cent.

For best application, the ammonia release hose can be too short. The 2-foot hose released the ammonia too near the leading edge of the overturning plow slice. There is some opportunity for the ammonia to escape in the overturning turbulent furrow slice. Both the 3-and-4-foot lengths released the ammonia under the furrow slice after the inversion of the soil by the plow had been completed. The zone of absorption for the 4-foot hose length is more concentrated which restricts the area of availability to plant roots. For this reason, the 3-foot hose length may be more desirable (Figure 7).

There are no advantages using the longer 4-foot hose. The ammonia losses of less than 0.5 per cent were the same for both hose lengths. At 3 feet behind the plow share point, the ammonia released is adequately sealed from escape by the covering furrow slice. The release point is also out of the area of soil plowing turbulence.

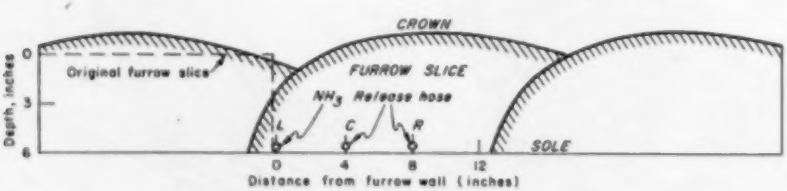


FIGURE 5. CROSS SECTION OF FURROW SLICE SHOWING LATERAL POSITIONS OF NH_3 RELEASE HOSE USED FOR TESTS

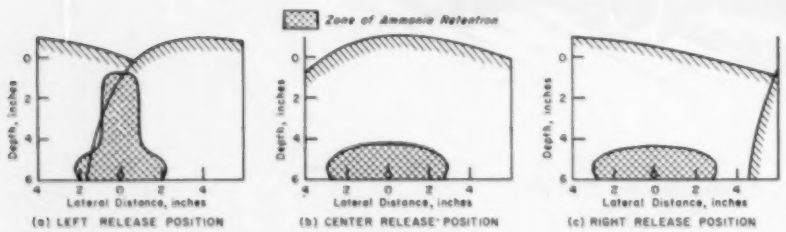


FIGURE 6. EFFECT OF LATERAL POSITION OF RELEASE HOSE ON AMMONIA DISTRIBUTION

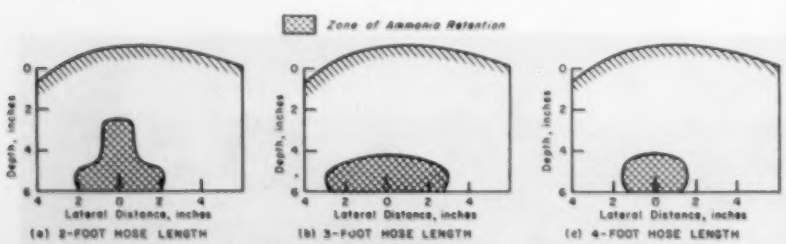
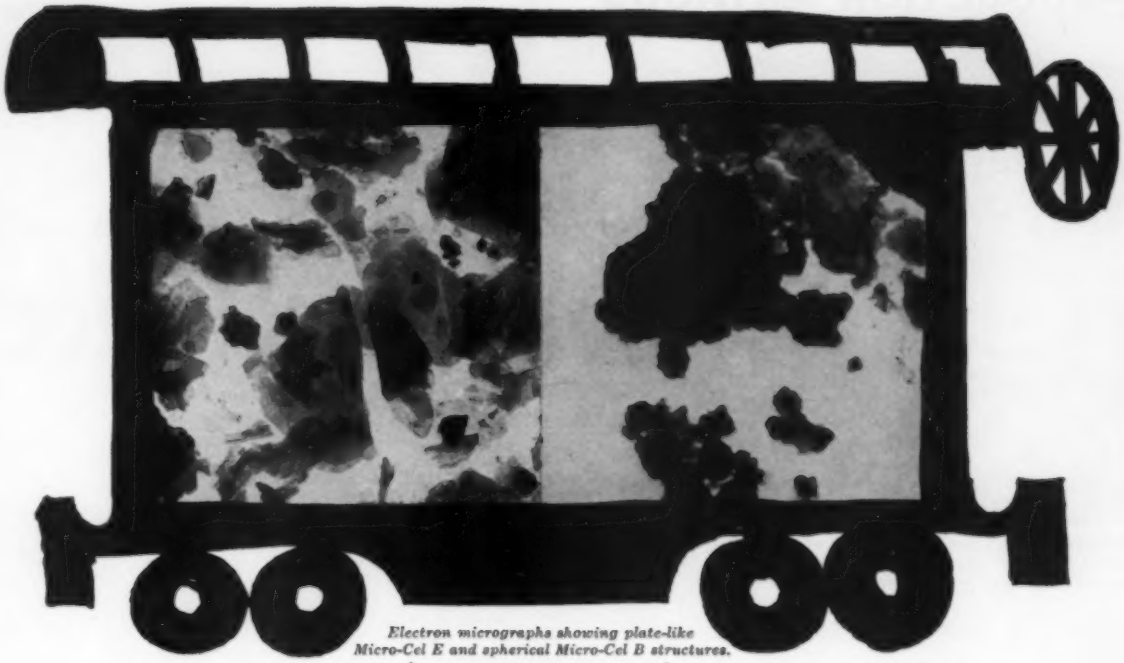


FIGURE 7. EFFECT OF LENGTH OF RELEASE HOSE ON AMMONIA DISTRIBUTION

SUMMARY

In summary, when properly applied, anhydrous ammonia can be safely plowed down with insignificant losses. The release hose must be attached so that ammonia is (1) applied deeply enough, (2) far enough from the furrow walls, and (3) the soil must be completely inverted by the plow moldboard. Of course, the soil must also be in normal plowing condition, neither extremely wet nor exceedingly dry.

Plowdown of anhydrous ammonia, either during fall or spring, saves time, labor, and decreases implement travel over the field. This way of making preplant applications of ammonia distributes field work and reduces soil compaction, thus promoting minimum tillage practices.



Electron micrographs showing plate-like Micro-Cel E and spherical Micro-Cel B structures.

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Micro-Cel®, Johns-Manville's inert synthetic calcium silicate, permits 75% DDT concentration. Other freight-saving, high toxicant concentrations include: 50% Chlordane, 70% Toxaphene, 50% Heptachlor, 75% Aldrin and 50% Aramite. Micro-Cel's unique structural characteristics (surface areas up to 175 sq. m/gr) reduce caking, improve flowability, increase suspendability and extend shelf life. For further information, samples and technical assistance, mail in the coupon below!

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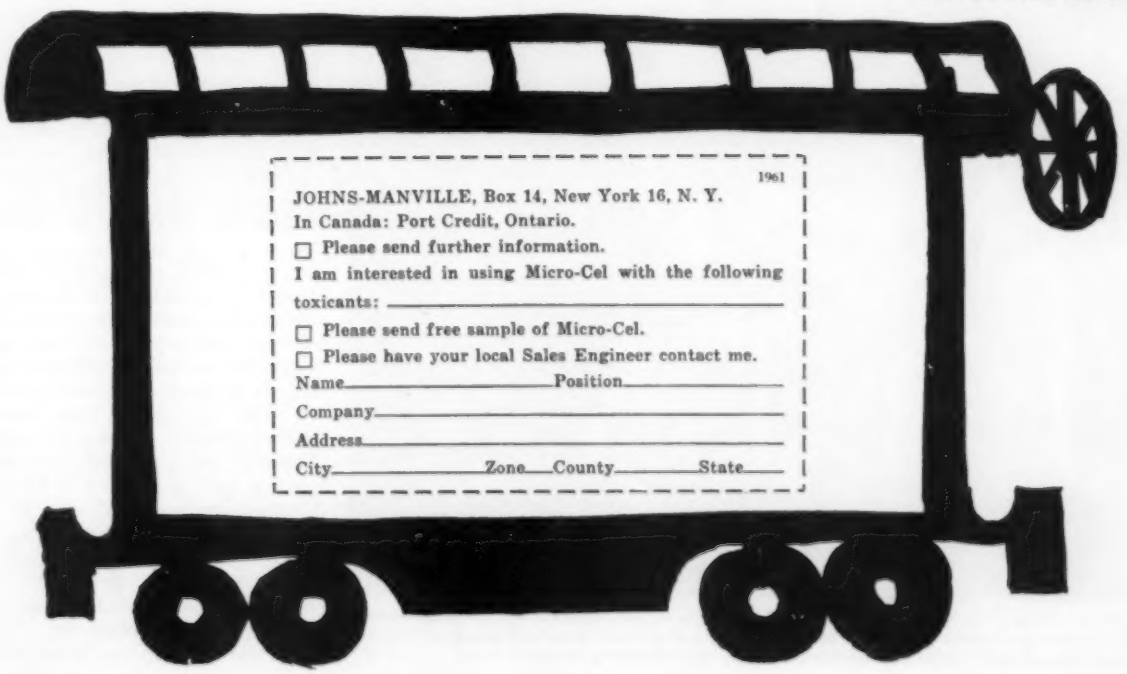

1961

JOHNS-MANVILLE, Box 14, New York 16, N. Y.
In Canada: Port Credit, Ontario.

☐ Please send further information.

I am interested in using Micro-Cel with the following toxicants: _____

☐ Please send free sample of Micro-Cel.

☐ Please have your local Sales Engineer contact me.

Name _____ Position _____

Company _____

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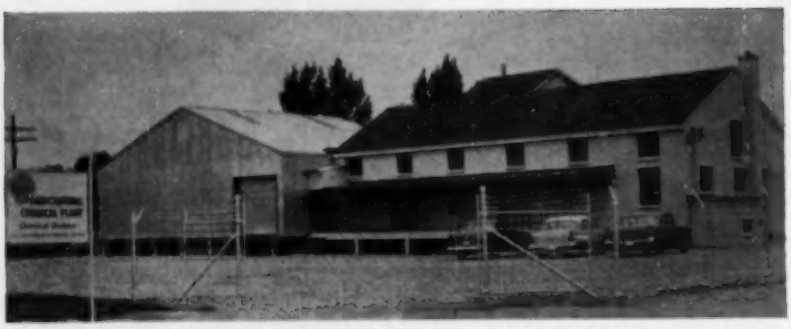
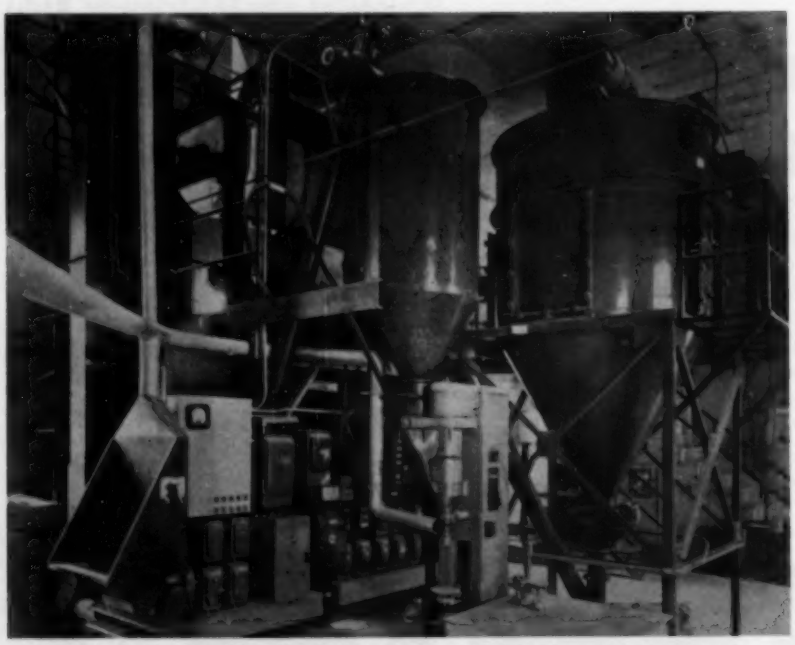
Andrew Stewart Simcoe plant manager, checks Pulver Mill. Shell employees can remove or replace classifier bars within minutes.

Maintaining QUALITY CONTROL

At Shell Oil Company of Canada's Simcoe Plant



Shell Oil Company of Canada's pesticide plant in Simcoe, Ontario. Built two years ago, the plant was expanded last year to produce 95% 325 mesh.



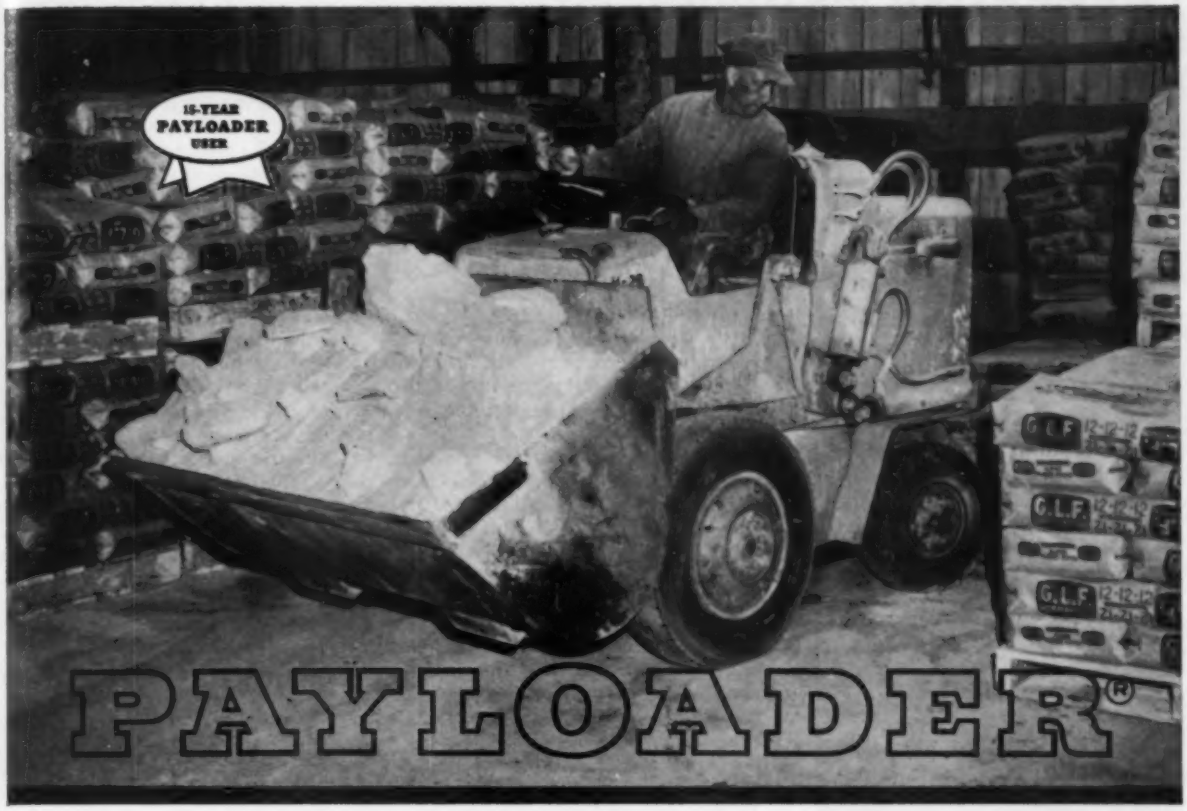
Overall view of the formulating plant. Raw chemicals are fed into hopper at left, are bucket elevator conveyed to pre-blender near roof of building (just right of elevator), mixed and passed on to further crushing and blending prior to collection and filtering visible in right of photo.

LESS than three years ago, Shell Oil Company of Canada was marketing pesticide dusts and wettable powders formulated for the company by outside sources. Though these purchased chemicals, sold under the Shell name, lived up to the company's high quality control requirements, it was difficult for the firm to maintain this high quality control and still remain competitive in end-product pricing. Thus, in 1958, in order to combat growing supplier costs and to assure close control over manufacture and selling price, Shell entered fully into the pesticide field by erecting a company-operated insecticide-fungicide formulation plant at Simcoe, Ontario.

EXPANSION IN 1960

In 1960, to keep pace with the surging industry, Shell expanded its line, entering the 95 per cent through 325 agricultural chemical market. Until then, the company's two-year old Simcoe mill—which established Shell as an important factor in the field—simply would not produce any substantial amounts of 50 or 75 per cent dieldrin, aldrin or DDT in the 95 per cent 325 range. The decision "to improve particle size of concentrates produced by dust blending machinery" was made in 1959. At that time, the Simcoe insecticide formulating equipment consisted of an inlet hopper for raw materials, bucket elevator, pre-loader, grinding-blending pulverizer, after-mixer, bag packers and supplemental equipment. Concentrates produced were 60-75 per cent through 325 mesh.

The company wanted to produce biologically-effective, lump-free concentrates in the 95 per cent 325 range, competitive in price and quality; with uniform dispersion of toxicants, maximum



continuous, dependable production

A 4-wheel drive **PAYLOADER** (Model H-70) is used by the Mills Division of G.L.F. to switch an average of 50 in and out-bound railroad cars daily on company-owned spur tracks. An average push moves 4 or 5 cars at a time. Average weight of loaded car is 95-tons.

1,500 hours and no downtime . . . that's the record of the H-25 PAYLOADER in its first year of operation in the Soil Building Division, Co-operative G.L.F. Exchange, Inc., at the Port of Albany, N. Y. This performance prompted Manager Harold Davis to say, "Our H-25 PAYLOADER proved to be a real workhorse . . . ruggedly constructed for continuous, dependable production."

G.L.F. has plenty of experience to back up this judgment. They manufacture granular fertilizer at the rate of 30,000-tons annually at this plant, and have used PAYLOADER tractor-shovels for 15 years to unload rail-cars, convey materials to the mixing operation, charge bagging machines and for bulk loading at their many plants.

In logging 1,500 hours, they estimate this PAYLOADER handled 30,000 tons of fertilizer on a maximum 200-foot delivery cycle: Conveying materials to storage, it averaged 20 tons per hour; in moving material from the bins to the packer it averaged 15-20 ton per hour.

Production Protection . . . many special features are "built-into" the H-25 PAYLOADER to protect its mechanical and electric parts against downtime due to damage from dust, moisture and corrosion. Also, it is the only loader in the 2,500-lb. operating capacity class with a *complete* power-shift transmission (2 forward and 2 reverse speeds). Power-steering, power transfer differential and wet-sleeve overhead valve engine are standard. Call your nearby Hough Distributor for complete data and a demonstration on the H-25 or, return the coupon.

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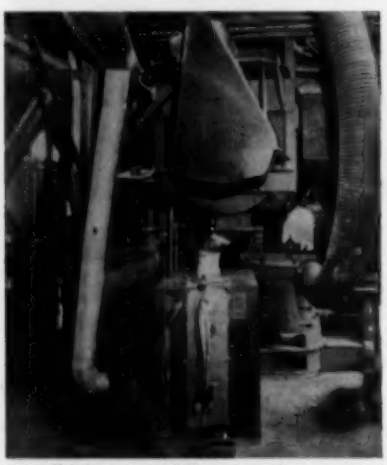
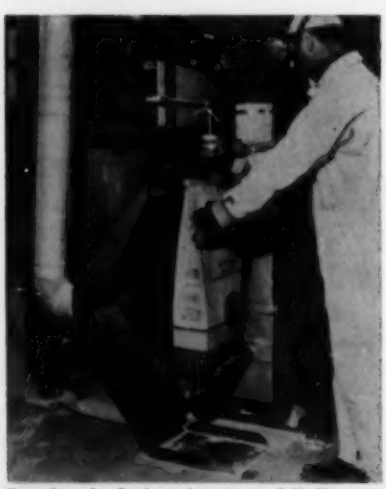
Quality Control *(Continued)*

Introduction of chemicals into hopper begins formulating process. Note respirator mask worn whenever working with toxic chemicals.



For all 95 per cent 325 mesh products, material is pneumatically fed to Pulver Mill, lower right, which was added in 1960.



Bagging the final product. Most of Shell's pesticides are shipped in 50-pound or 25-pound multiwalls. Some custom items are shipped in as small as three pound quantities.

friability, integrally blended conditioning agents, and diluents of maximum fineness. By feeding DDT slowly while closely controlling heat and ventilation throughout the process, for example—providing the DDT was aged for a week or more—the existing plant produced 50 per cent concentrates of 90 per cent 325 mesh, but it could not provide 75 per cent concentrates in any sizable quantities without tying up the entire process plant to make several passes through the pulverizer. To achieve this concentration, either pregrinding or an additional fine grinding step during process would be necessary.

Shell considered both and determined that an impact mill with air classifier would produce 1000-2100/lbs/hr of 75 per cent concentrates in the desired range, and 1500-2000/lbs/hr of 50 per cent. Operating costs for the anticipated jet mill output would average three times that of the Pulver-Mill. The impact mill with an air classifier would produce 50 per cent concentrates of which 97.5 per cent would pass through 325 mesh (average particle size, three microns), and 75 per cent concentrates which would pass a minimum of 90 per cent through 325.

Economic considerations fell on the side of airswept impaction. Pre-grinding with existing equipment as an initial, problem-solving step was ruled out almost immediately because, although lowest in initial and operating costs and highest in productivity, the resultant insecticides would be of unequal quality, hence less effective. Furthermore, this method would not produce satisfactory 75 per cent concentration products. Added to these drawbacks was the fact that it would increase initial formulation costs.

Shell therefore turned to impact mill manufacturers, seeking a unit which could consistently produce 95 per cent 325 mesh products—DDT, aldrin, dieldrin, endrin, copper dusts. Quick elimination of a number of concerns narrowed the field to two, one of which was Sturtevant Mill Company of Dorchester, Massachusetts, a company which introduced a new concept in impact milling in 1959—the Pulver Mill, an impact mill with stationary deflector blades and integral air classifier.

Tests were conducted on the two impact mills in December, 1959—all on 75 per cent concentration of DDT and aldrin on the assumption that, since these materials are most difficult to grind and have a tendency to melt and clog under impaction and attritional heat, the mill would automatically handle less difficult materials if it could operate satisfactorily on these.

In testing, aldrin was first preground in the existing pulverizer to reduce it to the same size as its carrier, lest the carrier escape before the aldrin was impact-ground, causing the machine to gum up. Processing about half a ton an hour in the Pulver Mill, 70 per cent of the 75 per cent concentration aldrin passed through 325 mesh. A second pass yielded what Shell determined to be 99 per cent, which an outside lab confirmed as 99.5 per cent.

On the first run 87.9 per cent of the 75 per cent formulation DDT passed through 325.

Both these figures have been upgraded substantially since the installation of the unit. Not uncommon is 99 per cent, and reduced feed rate can maintain this high or higher efficiency, depending upon weather and other variables. Grinding efficiency is highest during the cooler months, which corresponds to Simcoe's January-to-June busy season. To obtain desired percentiles, Shell passes aldrin and DDT through both the original pulverizer and the Pulver-Mill as part of the normal process. Dieldrin passes only through the Pulver Mill.

The Sturtevant unit was chosen over competitive equipment for several reasons. First, initial cost was less and an economic study showed that the mill would pay for itself within nine to ten months. Secondly evidence showed that the competitive unit had a tendency to overload and clog, while the Pulver-Mill did not. Third, a rubber lining easily installed in the Sturtevant machine reduced heat buildup and caking and cut cleanout time as well. And, while the rubber lining will require annual or bi-annual replacement, depending upon production rate and hardness of carrier, no wear will occur on the mill proper, thanks to the protective lining.

HOW IT WORKS

In the Pulver Mill, feed is pulled into the pulverizing zone by a cooling, whirling vertical air flow created by special vanes, or classifier blades, of which the unit has 12. (Extra blades are some times employed). These vanes affect both particle size and production rate and they may be increased or decreased in number—it takes a total of about ten minutes to remove half the blades—as required. For most materials at Simcoe, and for all DDT and aldrin, Shell uses all 12 blades. For dieldrin and regrinding purposes, half are used.

Once the feed is in the pulverizing area, sturdy revolving impactors crunch it against stationary wall impactors and the housing walls, which "bounce" the larger particles back into the grinding zone while predetermined-size pulver-

(Continued on page 56)

The Big Bean...

Staff of life for centuries in the Orient, the soybean came to this country in the twenties. The plant is rich in the vitamins B and G, edible by animals. From the soybean plant grow the beans that have 20% fat content—leading oil crop of the U.S.—and 40% protein.

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"Souped up" program increased fertilizer use 42 per cent!

FARMERS RESPOND

to extension-industry cooperation

By GORDON J. RYDER and EVERETT M. ROGERS*

THE Miami County, Ohio fertilizer demonstration program was developed basically to determine what effect fertilizer demonstrations would have on changing farmers' attitude toward fertilizer use. The planning stages of this program began in the fall of 1958 in Miami County, Ohio. The National Plant Food Institute sponsored this project in cooperation with the Department of Agricultural Economics and Rural Sociology, the Department of Agronomy and Ohio Agricultural Extension Service at The Ohio State University.

TABLE 1
Tons Single Element Fertilizers

	Miami	Champaign
Fall 1958	186	105
Spring 1959	1331	758
Total	1517	863
Fall 1959	218	113
Spring 1960	1775	765
Total	1993	878
Tons Increase	**476**	**15**

TABLE 2
Tons Mixed Fertilizer

	Miami	Champaign
Fall 1958	3559	2640
Spring 1959	7235	8600
Total	10,794	11,240
Fall 1959	4088	2969
Spring 1960	11402	10406
Total	15,490	13,374
Tons Increase	**4,696**	**2,134**

TABLE 3
County Fertilizer Sales

	Tons		
	N	P_2O_5	K_2O
Miami			
1958-59	1258	1918	1582
1959-60	1651	2502	2108
% Increase	31	30	33
Champaign			
1958-59	803	1750	1550
1959-60	1018	2172	1786
% Increase	21	24	14

The rural sociologist conducted a personal interview survey with 86 farmers in Miami County and 40 farmers in Champaign County, the control county, in December of 1958 to determine the farmer's present level of fertilizer understanding and his attitudes toward fertilizer use.

EIGHTEEN COMPANIES COOPERATED

All member companies of the National Plant Food Institute selling fertilizer in Miami County were contacted and solicited for their cooperation and participation in this program. Eighteen fertilizer companies offered the services of 21 of their salesmen and agronomists to work with the extension agronomist and the county agent in conducting the demonstration program.

Detailed plans of the organization of the program and assignment of the farmer demonstrators to the industry men were made in the spring of 1959. During the summer, 49 fertilizer demonstrations on corn and 13 fertilizer demonstrations on meadow crops were established. Forty-seven corn demonstrations and 10 meadow demonstrations were completed satisfactorily and included in the summary data reported last year.

At the completion of the 1959 demonstration program, the farmer demonstrators requested that the demonstrations be continued for the 1960 growing season. Thirty-eight demonstrations on corn and 10 fertilizer demonstrations on meadow crops were completed this year.

At the end of the 1959 demonstration year, a follow-up survey was made with the same sample in both counties in order to determine what change the demonstrations had on the attitude of the farmers in the two counties. Data was also gathered by rural sociologists at the Ohio Agricultural Experiment Station from the 47 farmer-demonstrators.

WHAT THEY WANTED TO KNOW

An attempt was made to measure the effect of other activities of this program, such as:

(1) To see if farmers could be motivated to use more fertilizer by industry—university cooperation.

(2) To measure the change of attitude of farmers toward the use of fertilizer and toward the industry representatives.

(3) To measure the change in fertilizer consumption due to the demonstration program conducted in the demonstration county.

(4) To train the fertilizer salesman in establishing reliable demonstrations.

(5) To determine the farmers' attitude toward a comprehensive demonstration.

(6) To get farmers to try new practices—soil testing, higher planting rates and proper fertilizer use according to soil test recommendations.

(7) To give the farmer practice in a fertilizer trial and build his self-confidence.

At the beginning of the program, the extension agronomist requested and received sales reports from all companies selling fertilizer materials in Miami County and the control county, starting with the fall sales of 1958. This was to get a cross-check of the actual fertilizer consumption in the two counties as compared to what the farmers in the survey would answer as to their fertilizer use.

Table 1 shows the fertilizer consumption in each of the two counties by each six month period in the two year sales report. It will be noted that the fertilizer use of nitrogen, phosphate and potash materials increased 476 tons in Miami County for the second year over the year previous to the fertilizer demonstrations, while it increased only 15 tons in the control county which was adjacent to the demonstration county. In tabulating this data, practically the entire increase in tonnage was nitrogen-carrying materials.

Table 2 shows the fertilizer sales reported for the same periods in the two counties for the mixed fertilizer materials. The use of fertilizer in Miami County increased from 10,794 tons to

(Please turn page)

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15,490 tons. This was an increase of 4,696 tons for the fertilizer year following the first year of the demonstration program.

In the control county (Champaign) the fertilizer use increased from 11,240 tons to 13,374 tons or an increase of 2,134 tons for this same period.

The summary of the fertilizer consumption for the same period shown by the nutrient breakdown of N, P_2O_5 and K_2O is shown in table 3.

The fertilizer sales data reported shows an increase of 31% for nitrogen, 30% for P_2O_5 and 33% increase for K_2O in Miami County, for the fiscal year, 1959, over the previous year, 1958-59. For the same period the fertilizer use increased in Champaign County for 21% nitrogen, 24% P_2O_5 and 14% K_2O. The amount of increase in Champaign County was rather surprising when the data was first tabulated. The increase of fertilizer use for the state of Ohio for the same period showed a 6% increase in nitrogen, 8% for P_2O_5 and 2% for K_2O.

JUST ONE "HITCH" . . .

We realize now that the control county was too close to the demonstration county because the effects of the demonstration program may have spilled across county lines. In summarizing the individual data from the various companies selling fertilizer goods in both counties, we found that four companies whose sales representatives were active in the Miami County demonstration program had Champaign as their primary area of operation. The fertilizer tonnage of these four companies increased tremendously in Champaign County for the second year over the year 1958-59. In checking personally with the four demonstration supervisors of these four companies, they stated that they put into practice some of the things they had learned in Miami County in their sales programs in Champaign County. The tonnage reports of the 19 other companies selling fertilizer goods in Champaign County were almost identical for the two year period. When the increased sales of these four companies that participated in Miami County demonstrations were deducted from the total increase, it showed that the consumption in Champaign County increased only about 2% above that for the state average.

The data gathered on farmers' attitudes toward fertilizer by rural sociologists in the before-after studies is not entirely consistent with that we secured from the fertilizer industry on actual fertilizer sales (although the two sets of data are not directly comparable). We found no significant increase in farmers' attitudes toward fertilizer as a result of the demonstration program.

There may be several reasons for this lack of shift in attitudes:

(1) Past sociological studies show that *attitudes* of any kind are very difficult to change, particularly over a relatively short time period. The change in attitudes may have been more significant if the follow-up study had been made a year after completion of the demonstration program.

(2) It is possible for fertilizer use to change (as it evidently did) without a major change in attitudes.

SOIL TESTING IS THE KEY

We found evidence for example, that *soil testing* is a key step in securing a change in farmer's use of fertilizer. Attitudes do not seem to affect fertilizer use for farmers who soil test; however there is a strong relationship between attitudes and use for those farmers who do not soil test. This finding suggests that soil testing may be one method of "cancelling out" the influence of negative attitudes toward fertilizer.

What are some of the major attitudinal blocks to using higher fertilizer application? Our data show that many farmers perceive fertilizer cost as prohibitive to higher application or that they feel they are already using optimum fertilizer levels (few actually are doing so.) Our respondents were asked to respond to a sentence completion question, "I'd use more fertilizer, but —." The responses are shown in Table 4.

Table 4 data from other projective tests with our respondents indicates that anxieties about dry weather and the burning of crops by fertilizer is an attitude that needs to be overcome before higher fertilizer levels will result.

Farmers source of information was studied as shown in Table 5.

Fertilizer dealers and salesmen were named by 32 per cent of our respondents, as their most important source of information about fertilizer. This is of greater importance for commercial sources of information than has been found in previous studies.

The fertilizer sales of both mixed goods and single element carried increased 42% in Miami County as compared to 18% for the same period in Champaign County. The state average increase was 3% for the increase for the same period. What is the future sales potential of fertilizer materials in Miami County and the state of Ohio? These data are shown in Table 6.

Based on soil test analysis for Miami County and the state of Ohio, if every crop land acre was fertilized according to soil test recommendation, the use in Miami County at the present time is 36% of the nitrogen, 38% of the P_2O_5 and 40% of the K_2O. For the state of Ohio conservatively figuring we are using 52% nitrogen, 36% P_2O_5 and 40% of the K_2O that we should be using. This does not account for any fertilizer that would be applied to permanent pastures or speciality uses such as lawn and gardens.

The study described in this report illustrates the level of cooperation that can be obtained among industry, Extension and research workers. Each had a role in the total design of the demonstration study and carried it out.

Two Ohio Agricultural Experiment Station Research Bulletins are being printed; one describes the effect of the demonstrations on farmer's attitudes toward fertilizer, the other analyses the role of the demonstrator-farmers. Both should appear in the near future and will offer further detail on the present study.

TABLE 4
Attitudinal Blocks to Higher Fertilizer Application

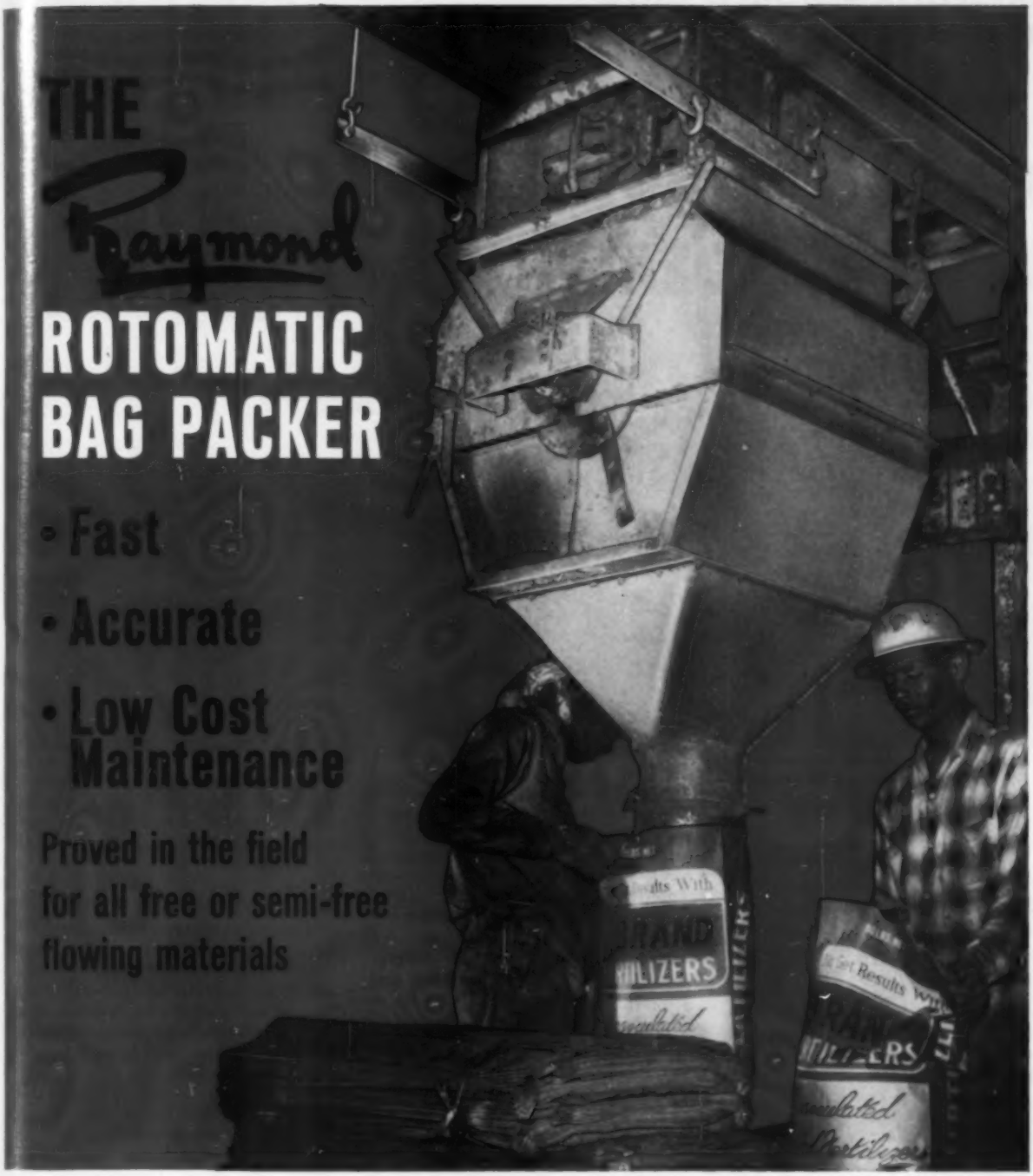
Blocks to Higher Applications	Per Cent of Respondents
Costs too much	44%
Think I use enough now	36%
Landlord won't let me	7%
Manure is better (or) fertilizer burns crops	6%
I follow soil tests	4%
I'm not equipped	3%
Total	100%

TABLE 5
Most Important Fertilizer Information Source

	Farmer Sample	Demonstrators
Dealers and salesmen	32%	13%
Farm magazines	23%	21%
County agent or bulletins	15%	57%
Neighbors and relatives	8%	—
Other sources	22%	9%
Total	100%	100%

TABLE 6
Potential Fertilizer Sales

	1958-59 Sold			Potential Sales		
	N	P_2O_5	K_2O	N	P_2O_5	K_2O
Miami	1258	1918	1582	3435	5040	3975
% of potential				36	38	40
Ohio	75,502	135,313	123,058	144,400	375,000	309,000
% of potential				52	36	40



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What the **MANUFACTURER** *can do for the* **DEALER**

Part II—COMMON GROUND

By F. E. HARTZLER

THE manufacturer and the dealer have some things in common and some things not in common. These areas of common or mutual agreement must be understood and the areas of disagreement must also be understood. Let us start with common ground.

Both the dealer and the manufacturer are interested in:

1) A large volume
2) A profit
3) As long a season as possible
4) The good name of the product
5) Satisfied customers
6) Repeat business
7) Steady sales growth
8) Securing good accounts

COMMON DIFFERENCES

On the other hand, the dealer wants his product at as low a price as possible, while the manufacturer would like to secure as high a price as possible. In this area there must, of necessity, be mutual concern and mutual antagonism.

There are other common differences that are sometimes lost in the shuffle. These differences are in the area of sales, product knowledge, advertising and credit. There may be differences of opinion in regard to delivery date and procedures, also. Let's examine each of these in detail.

Sales. The sales techniques of the manufacturer's salesman will not necessarily work for the dealer. The dealer, in the first place, is in a position to see the customer several times a year without too great a problem of travel. In the second place, the dealer should gear his sales presentation to individual situations rather than to generalities since he is selling to the individual. As a matter of fact, if the manufacturer's salesman were as well equipped to help a retailer as most dealers are to help farmers, this alone would be a great help.

Essentially the dealer must use the technique of soft selling and pray for a break. A hard sell followed by bad weather or almost any other combination of bad luck can lose a customer for a long time.

Product Knowledge. For the manufacturer product knowledge must be of a general nature: "This type of product used in most situations will result in such and such results." The manufacturer covers a wider area and cannot be expected to utilize many specific situations. However, the dealer is not selling generalities. He is selling a specific product to a specific customer in a given year. What he needs is some product knowledge that will enable him to speak with authority in this specific situation and not in general terms. It doesn't help much to answer a man with the argument, "usually this treatment gets these results," when you are looking the exception right in the eye. This man has just lost money, and he doesn't care whether he's an exception or not.

Advertising. The advertising claims of the manufacturer in the trade magazine or popular magazines are usually based upon an emotional appeal. This is as it should be. Such advertising is designed to create desire. Local advertising, however, since it is much closer to the customer, must be more precise and more accurate. This usually means more subdued in claims. Examine any magazine you wish and then turn to the ads for the same products in the local newspaper and the difference will loom out at you.

Testimonials are a mixed blessing. In local advertising they can be the finest thing in the world. In national or regional advertising they are frequently worse than useless.

Credit. Credit will always be a difficult problem, because each dealer is in a local situation and has problems which seem to him to be unique. Here the manufacturer can be of real help in settling such differences as they have. The dealer may feel that his area and his customers are in trouble, and that no one else is sharing this difficulty. The manufacturer, on the other hand, may realize fully well that there is nothing unique or different in the situation. The area of difference will be over collections. The dealer will feel that the inhuman corporation should be able to wait until his real, personal friends and customers can correct their financial situations. This is an in-group vs. out-group situation.

THE MANUFACTURER'S POSITION

The manufacturer would be perfectly happy if he never had to worry about distribution. He would be perfectly content to just manufacture the stuff, put it in cars and ship it out. A week or so later, preferably in ten days, the checks would come back and he could go on manufacturing.

Unfortunately he can seldom do this. He, too, must sell his product. Now a machine is a wonderful thing. It is not contrary; it doesn't lie to you; it doesn't argue over price. Consequently, the manufacturer is usually frustrated when it comes to distribution.

He should be familiar with one wonderful tool—quality control statistics. Using this tool in his study of his retail operations he could quickly find many of the things that he needs to know. For example, there are differences in products coming out of the machine. He learns to measure these and to use the measurements. There are differences in retail outlets, but these, too, are usually measurable if you know how to put them together. *(Please turn page)*

VELSICOL

INSECTICIDE OUTLOOK for 1961:

plans, promotions, and favorable trends indicate expanded sales opportunities for formulators!

HEPTACHLOR

...growing demand!

Extensive tests conducted by leading experiment stations prove that Heptachlor can't be beat for effectiveness in control of soil insects. Demand for Heptachlor continues to grow. In 1961, you will see more intensive advertising to capture even more sales. Besides major regional and state media, Heptachlor will be promoted in hundreds of local newspapers and billboards.

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Endrin is relatively new, in terms of uses and acceptance. 1960 saw the development of many new Endrin markets. Apples, potatoes, cotton and many other crops were widely treated with Endrin during the past year. The use of Endrin-Methyl Parathion mixtures for cotton insect control proved especially popular and effective. In 1961, you can anticipate a big Endrin demand in all markets, helped along by strong promotional programs keyed to local requirements.

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MERCHANDISING AIDS
PROMOTION

What the MANUFACTURER *can do for the* DEALER *(Continued)*

The manufacturer can learn that there are certain areas that are his by virtue of what Schlicter of Harvard once called space monopoly. He will be able to measure how much of this he wants to hold, and how much he doesn't even want to play with. As a matter of fact, the first thing that a manufacturer should do is to map out the areas where he has a definite edge. This edge may be nothing more than freight rates, but this is still an edge.

Each manufacturer should try to calculate his basic saturation in this area and not expect it all, but determine whether his share is fifty percent, forty percent, or eighty percent. Then he should gear his advertising and dealer program to secure this share. For example, a manufacturer in Minnesota would be foolish to try to compete in Southern California. His real territory probably lies somewhere in the state of Minnesota with the possibility that he might spill over into a couple of other states depending upon freight, full or single line, and the basic dealer organization that he chose to set up. With this in mind he might set up a name dealer within a radius of two hundred miles and casual dealers on the fringes.

PREPARE A QUESTIONNAIRE

Once a manufacturer understands the market, the dealer and his own position he is ready to begin an intensive study of his next moves. He should begin by studying his dealers. His salesmen will be a valuable aid in this study. For example, he might make up a questionnaire for dealers and ask his salesmen to get it filled out:

1) Why do you buy from us?
2) What do we offer that other firms do not?
3) What do you like about some competing brands?
4) If you were to select three of the following areas, in which ones would you most like to have help? Accounting, Merchandising, Credit and Collections, Sales Training, Product Knowledge, Advertising, General Management, Analysis of Financial Records, Selection and Training of People or Organization of Time.

I am not fool enough to go out on a limb, for I don't think that either you or I can guess what they will want most. But it would pay to ask them. The man who helps them with their problems is the man who seems to them to be worth being loyal to.

Washington Viewpoint

(Continued from page 6)

in the last few months total $110 million. More will be made available as necessary.

One-half of the storage payments for reseal of on-farm storage under price support has been made available to farmers. This amounts to about a $25 million shot-in-the-arm for farmers this year who normally would have to wait from one to five months to collect. An additional $50 million has been made available under the Farm Housing Loan Program which means the farmer won't have to pinch on supplies in order to service his farm buildings. There is still another $257 million remaining for this purpose which has been untapped. Farmers have still another $35 million available for general operating credit.

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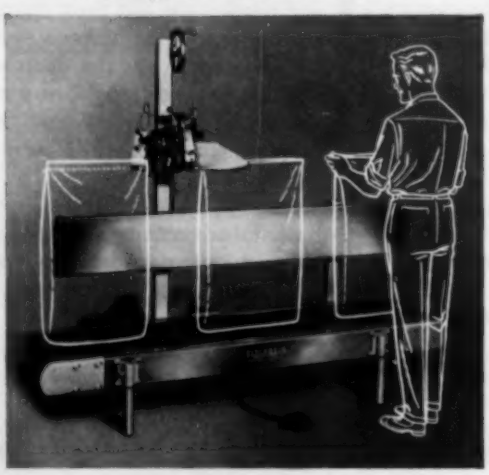

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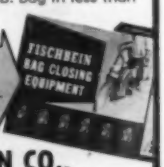

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PEST REPORTS *By Jack W. Bongberg**

Severe forest damage

indicated in summary reports

SUMMARY reports on conditions of forest insects during 1960 received from some of the Forest Service Experiment Stations throughout the country indicate, with minor exceptions, severe damage and destruction to the forest resources, and in many places, large-scale control projects were needed to suppress outbreak populations.

LAKE STATES

In the lake states, the large-scale outbreak of spruce budworm expanded in area and increased in intensity. Nearly 100,000 acres of spruce-fir timber are now so severely defoliated that top-killing and tree mortality is prevalent throughout the infestation area. Control was undertaken during June to suppress populations and thus forestall excessive tree-killing until stands can be harvested. Additional control by aerial spraying likely will be undertaken during 1961.

Populations of the jack-pine budworm also increased greatly in several areas of the lake states and chemical control was applied in some places to minimize tree damage and tree-killing.

Defoliation of pines by several species of sawflies occurred extensively in Minnesota, Michigan and Wisconsin. The red-headed pine sawfly was most prevalent but the introduced pine sawfly also caused heavy defoliation in various parts of all three states.

SOUTHERN STATES

In the southern states, bark beetles continued to be the most important forest pests, but tree-killing was somewhat less than in recent years. Populations of the southern pine beetle in southeast Texas reached a peak in early summer but declined to a low level by late fall. The black turpentine beetle also was active and destructive to southern pines on low sites in parts of the Gulf states. The shallow root systems of trees on such sites are highly susceptible to injury by soil compaction and bruising by logging machinery, and injured trees are readily attacked and killed by the beetles. Damaging infestations are expected to continue in southern logging areas.

Extensive areas of water tupelo, black gum, sweet gum, and other bottomland hardwoods suffered heavy defoliation by forest tent caterpillar early in the season in portions of Louisiana and Alabama. This outbreak, dating from 1953, is now causing tree mortality in some places, and the killing of branches and tops in many others. Severely defoliated trees are now growing at less than half their normal rate.

INTERMOUNTAIN AREA

Infestations of various forest insects in the Intermountain and northern Rocky Mountain states were numerous and many were quite severe during 1960. The mountain pine beetle occurred in epidemic numbers and killed countless numbers of trees in many places. Stands of old-growth white pine in the Clearwater National Forest in Idaho suffered greatly; lodgepole pine in the high elevation zones in northern Utah, eastern Idaho, and western Wyoming were heavily infested; and second-growth ponderosa pine on the north shore of Lake Tahoe in Nevada and near Atlanta, Idaho, also suffered heavy tree-killing. Major effort was extended to reduce beetle populations in all infestations and thus minimize the rate of tree-killing in affected areas.

*Entomologist, Division of Forest Insect Research, U. S. D. A., Washington, D. C.

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fertilizing equipment which you can rent to your customers . . . spreads up to an acre per minute.

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*PATENT PENDING

distributor and dealer inquiries invited!

SPECIFICATIONS

Body Weight Approx.	1400 lbs.
Hopper Dimensions	60" x 84"
Wheel Track	74 inches
Axle Rating	4000# each axle
Type Axle	Tandem Torsion Spring
Fans	Angled Twin 19 in. Dia.
Wheel Bearing	Sealed Timkin Bearing
Capacity	2½ Ton
With Body Extension	19 in. 4 Ton
Spread Pattern	Approx. 45 Ft.
Spread Capacity Pr. Hr.	30-60 Acres
Field Speeds	
6 M.P.H.	30 Acres Pr. Hr.
12 M.P.H.	60 Acres Pr. Hr.
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Highway Speeds	up to 60 M.P.H.

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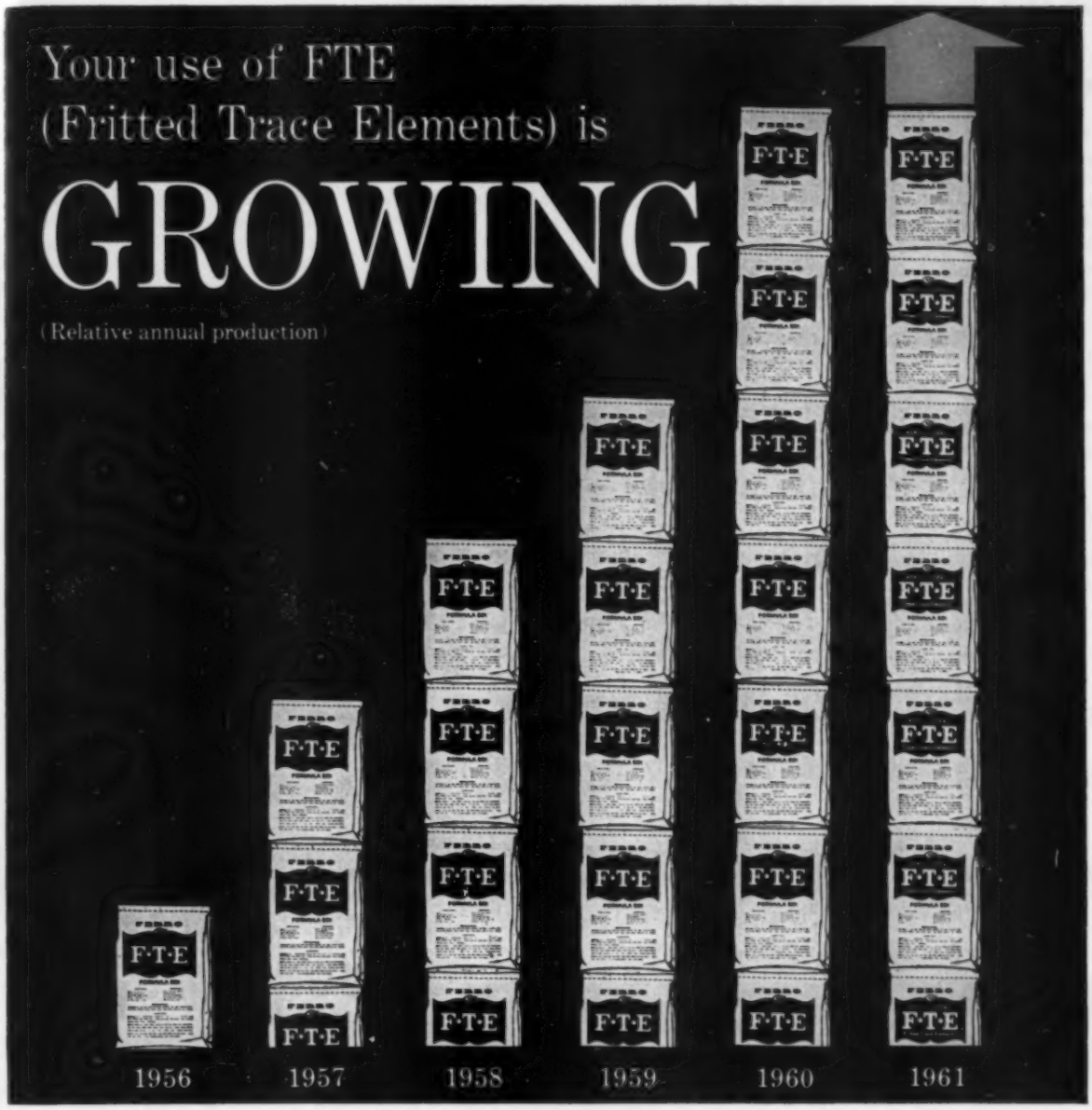

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FERRO

FERRO CORPORATION *Agricultural Division*

4150 East 56 Street • Cleveland 5, Ohio

PATENT REVIEWS *By Melvin Nord*

PESTICIDES

U. S. 2,955,976, issued Oct. 11, 1960, to Kenneth L. Godfrey and assigned to Monsanto Chemical Co., discloses a method of inhibiting nematodes in soils, by dispersing in the soil from 25-600 lbs. per acre of a product made by heating a mol of an ethylene polyamine with more than one mol of a monocarboxylic acid.

U. S. 2,956,921, issued Oct. 18, 1960, to Philip H. Santmyer and Joseph W. Baker and assigned to Monsanto Chemical Co., discloses nematocidal polyamine salts of phosphorothioic salts.

U. S. 2,956,922, issued Oct. 18, 1960 to John D. Garber and Harold C. Reynolds and assigned to Merck & Co., Inc., discloses a composition useful for the protection of plants against infectious organisms upon dilution with an inert carrier. The composition consists of a dry blend of streptomycin and clay.

U. S. 2,957,800, issued Oct. 25, 1960 to Thomas R. Hopkins, Ralph P. Neighbors, and Otto L. Hoffman, and assigned to Spencer Chemical Co., discloses the nematocidal properties of amides of dihalopropionic acids.

U. S. 2,959,518, issued Nov. 8, 1960 to Jan H. Uhlenbroek and Martinus J. Koopmans and assigned to North American Phillips Co., Inc., discloses a method and composition for destroying fungi harmful to plants.

U. S. 2,959,519, issued Nov. 8, 1960 to Angelo J. Speziale and Ernest G. Jaworski and assigned to Monsanto Chemical Co., discloses a fungicidal composition consisting of a 2-halo-4, 6-bis (amino)-s-triazine.

U. S. 2,960,395, issued Nov. 15, 1960 to Johannes T. Hackmann and Pieter Ten Haken, assigned to Shell Oil Co., discloses a plant growth regulant compound consisting of a dihydro-oxazolone derivative.

FERTILIZERS

U. S. 2,958,589, issued Nov. 1, 1960 to Oliver Lloyd Hayes and assigned to Commercial Solvents Corp., describes a process for the production of ammonium nitrate prills of predetermined size.

U. S. 2,958,594, issued Nov. 1, 1960 to Benjamin D. Halpern and Robert B. Dean, and assigned to The Borden Co., describes a method of making a solid urea-formaldehyde condensate and trace element fertilizer in which the trace element is only slowly soluble in contact with ground water.

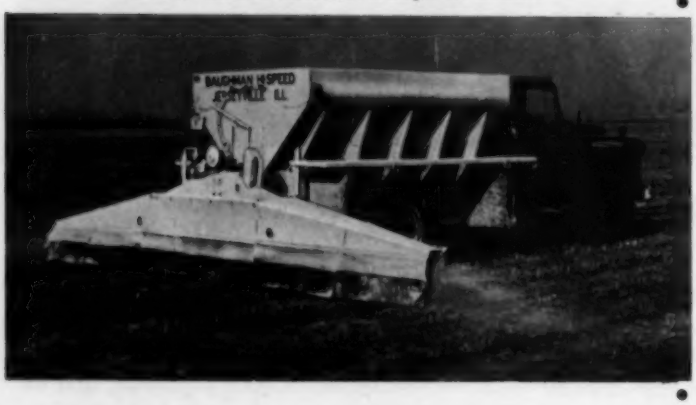
NEW FORMULATIONS

Amitrol-T is now available for commercial use from Amchem Products, Inc. It is a liquid formulation of 3-amino 1,2,4-triazole containing 2 lbs. of active ingredient per gallon. Its most outstanding use is as a pre-planting application to quackgrass followed by pre-emergence treatment of Atrazine 80W, Amchem reports.

A flowable formulation of **Sevin** has been developed by Stauffer Chemical Co. Containing four pounds of Sevin per gallon, the new product is said to be instantly dispersible in spray machinery—even in the low-agitation type units often used in airplanes.

strongest and most efficient spreader body ever built!

a few choice distributorships available



BAUGHMAN'S K-5

LIME and FERTILIZER SPREADER

Baughman engineering insures you:

LOWER MAINTENANCE COST... thanks to rugged construction, fewer parts and reliable Baughman quality throughout.

BETTER SPREADING... because you can accurately regulate the number of pounds spread per acre and be sure of uniform distribution.

LONGER BODY LIFE... a stronger body with extended side jacks, plus internal braces and reinforced top edge for full side support and greater protection.

GREATER VERSATILITY... the chance to select the drive, conveyor and distributor that best answers your spreading needs.

Your choice of...
- 4 DRIVES
- 2 CONVEYORS
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Write for Bulletin A-424.

Better Service... through better engineering. Service and parts from 200 service branches.

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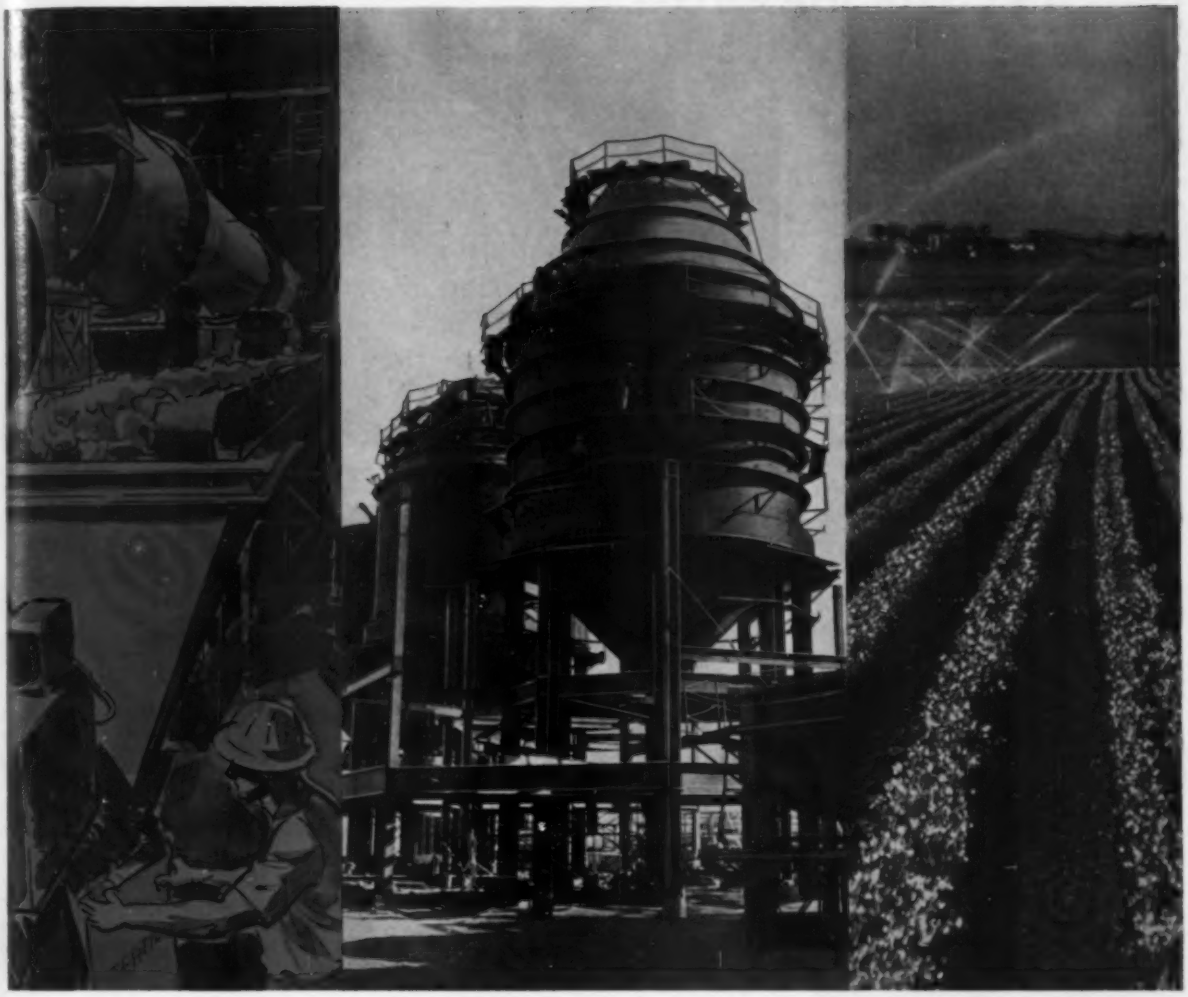


3-WAY BOOST IN POTASH

INCREASED PRODUCTION OF TRONA® MURIATE WILL SOON MEAN BETTER SERVICE...BETTER MIXED FERTILIZERS...HIGHER YIELDS OF QUALITY CROPS

Increased production of Muriate of Potash at Trona will be measured in three-way benefits. Expanded potash facilities, shown above, will soon make available from AP&CC more tonnage of free-flowing, uniform granule size Trona potash in granular and regular grades for agriculture's expanding needs. To the mixer, more quality potash from Trona will mean a better finished product . . . and to the grower, higher yields of quality crops.

TRONA® **American Potash & Chemical Corporation**

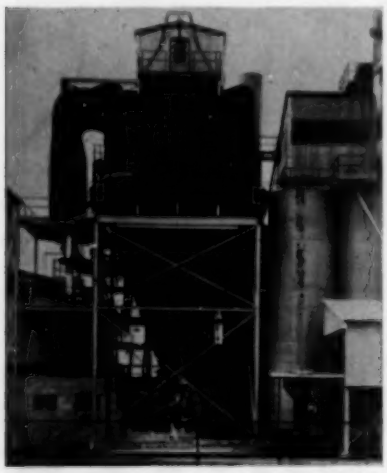
3000 W. SIXTH STREET, LOS ANGELES 54, CALIFORNIA
99 Park Ave., New York 16, N.Y.

Other Sales Offices: Chicago • San Francisco • Portland (Ore.) • Atlanta • Columbus (O.) • Shreveport

Groundbreaking ceremonies for a major new research center were staged Jan. 16 by **Niagara Chemical** Div. of Food Machinery and Chemical Corp. Scheduled for occupancy in October, the unit will contain laboratories for identification and measurement of minute chemical residues, a modern organic synthesis section and extensive biological screening and formulating laboratories.

A market-feasibility survey of the Houston-Gulf Coast area reportedly is being conducted by **First Mississippi** Corp. for a nitrogen complex to cost between $10 million and $15 million.

A 26-foot-diameter spray dryer is now operating at The **American Agricultural Chemical** Co.'s Carteret, N. J. facilities, reports Bowen Engineering, Inc., maker of spray dryers and spray drying equipment.



Mixing and blending, such as in the fertilizer field, has long been an "art" but may succumb to automation, G. E. Adams of General Electric Co. told the American Institute of Electrical Engineers last month. "The recent development of digital control computers and of new types of sensors have made possible the application of the techniques of automation to blending processes," Adams said.

Niagara Chemical Div. and community officials watch earthmover strip topsoil at the Middleport, N. Y. site of Niagara's new research center. Left to right are Lloyd R. Coster, Niagara; Charles H. Porter, Royalton-Hartland Central School; Stuart Bear, Niagara; Mayor Elton Birch of Middleport, and Drs. Oscar Johnson and Robert L. Gates, Niagara.

Anderson-Prichard Oil Corp. has opened a Memphis industrial solvents terminal at 1081 Kansas. Aliphatics, aromatics, alcohols, ketones, esters, glycols and chlorinated solvents are available there.

Armour Agricultural Chemical Co. has purchased **Ris-Van, Inc.,** from **Stepan Chemical Co.** The seven Ris-Van liquid mixed fertilizer plants in Iowa and Minnesota will continue under the Ris-Van name as a division of Armour Agricultural Chemical, and present staff will be retained, Armour reported. Armour recently announced a $60 million expansion program which includes new facilities for production of high analysis fertilizer materials. Ris-Van will thus be provided with a more complete line of basic materials for its operation. Stepan has announced it will make "anti-knock" gasoline additives, using funds freed by the sale of Ris-Van.

Texas Gulf Sulphur Co. has reached an agreement with the Denver and Rio Grande Western Railroad, whereby the latter firm will build a 40-mile stretch of track from its main line to serve the TGS $25 million **muriate of potash** plant to be built at Moab, Utah. The Moab plant, which will produce an estimated 1.5 million tons per year, is planned to be the largest single producer of muriate of potash in the Western Hemisphere.

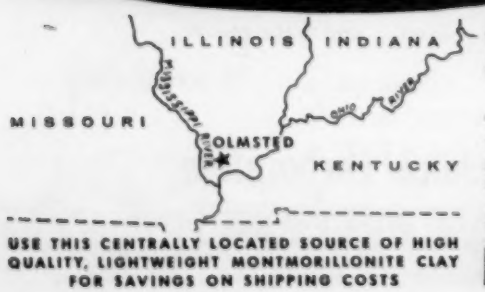
A one-story office building is being built for **Atlas Powder** Co. near Joplin, Mo. Space will be provided in the building for marketing personnel of **Solar Nitrogen Chemicals,** Inc., Solar, whose ownership is shared equally by Atlas and The Standard Oil Co. (Ohio), is erecting a new anhydrous ammonia-urea plant in the area.

CREEK-O-NITE CLAY

DUST
For Insecticide Carriers, Diluents

GRANULES
For Agriculture Applications

FINES
For Conditioning Fertilizers



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PRODUCED WHERE OHIO AND (★) MISSISSIPPI RIVERS MEET

This high grade clay is available in a variety of textures to meet specific needs.

SAMPLES AND PRICES WITHOUT OBLIGATION

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Send samples and data on CREEK-O-NITE:
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Today's Most Widely Imitated Insecticide Solvent... **ESPESOL 5**

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CALL OR WRITE FOR COMPLETE INFORMATION ON ESPESOL 5

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New York Office: 10 Rockefeller Plaza, New York, Phone Circle 7-2520
Chicago Office: 1515 N. Harlem, Oak Park, Illinois, Phone VI llage 8-5410
Cleveland Office: 20800 Center Ridge Rd., Cleveland, Ohio, Phone EDison 3-0188
Louisville Office: 4th and Broadway St., Louisville, Ky., Phone JUniper 3-7634
Atlanta Office: 3121 Maple Drive., N.E., Phone CEdar 3-3227
Long Beach Office: 2828 Junipero Ave., Long Beach, Phone NEvada 6-3301

Federal Chemical Co., a division of National Distillers & Chemical Corp., has purchased a fertilizer plant at Whitewater, Wis., from the **Wisconsin Farmco** Service Cooperative. The plant produces high analysis, pelleted fertilizers. This acquisition increases Federal's manufacturing facilities to seven.

Texas Gulf Sulphur Co. has announced that in view of the recent firming of prices in the world sulfur market, it has notified its customers that competitive allowances granted along the Atlantic seaboard and at Tampa have been revised to meet the new market conditions.

Hercules Powder Co. has announced beginning of operations on a multi-million dollar expansion program at Hercules, Calif. The expansion includes new manufacturing facilities to produce methanol, formaldehyde, urea-formaldehyde concentrates and slow nitrogen release urea-form for fertilizer applications.

Commercial Solvents Corp. has brought suit for breach of contract against The **Chemical and Industrial** Corp. of Cincinnati, O. Commercial Solvents said that the action relates to an arrangement between the two companies regarding construction by C & I of ammonium nitrate plants which utilize Commercial Solvents' processes.

Chemicals

A new formulation of **Guthion** insecticide for control of cotton insects has been announced by Chemagro Corp. Called Guthion cotton insecticide, the formulation can be applied at 6- to 8-day intervals and is claimed to give highly effective control of aphids, mites, cotton leafworms, cotton fleahoppers, thrips and boll weevils.

USDA has accepted several new claims for **malathion:** For control of aphids and pea weevil on peas and pea vines grown for forage; for control of pea aphid and vetch bruchid on vetch; aphids and leafhoppers on pasture, range grass and grass hay; army worms on grass, grass hay and alfalfa; aphids and spider mites on sugar beets; and lice, ticks and keds on sheep and goats.

Alco Oil & Chemical Corp. recently introduced **"Soil-Set,"** a rubber-based garden spray designed to provide a "protective blanket" for freshly seeded lawns. The product is available in several colors, including green and clear.

Despite its spectacular ability to drift and cause distant damage when misused, **2,4-D** can be used in sensitive crops such as grapes and may have a potential span of use far greater than at present. Oliver A. Leonard, botanist of the University of California at Davis, told the California Weed Conference in Fresno (Jan. 24-26) that selective weed-killers now coming into use may conquer annual weeds in vineyards and orchards—but 2,4-D, so far, gives most promise of controlling the serious perennial weed infestations which could follow.

Regulations governing mixed fertilizer grades and pesticides which may be sold in North Carolina have been extended until July 1, with the addition of one grade, 3-9-18, for peanuts.

Basic research to develop new knowledge of the mineral nutrition of plants, behavior of water on agricultural watersheds and new principles of rangeland soil management was urged by USDA's Soil, Water and Fertilizer Research Advisory Committee at its annual meeting in January. Dr. Robert Q. Parks, general manager of Nitrogen Products Div., W. R. Grace & Co. is a member of the committee.

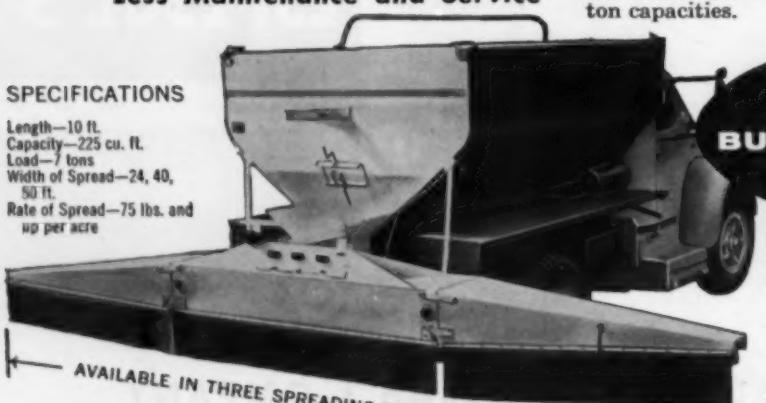
NEW DESIGN for TROUBLE-FREE FERTILIZER SPREADER PERFORMANCE

Greater Spreading Accuracy— Less Maintenance and Service

This new Simonsen bulk fertilizer spreader has the same basic, rugged construction features of the popular R710 model. In addition, new features have been incorporated for even greater convenience, accuracy and trouble-free operation. This new model "P" series is available in 4 to 13 ton capacities.

SPECIFICATIONS

Length—10 ft.
Capacity—225 cu. ft.
Load—7 tons
Width of Spread—24, 40, 50 ft.
Rate of Spread—75 lbs. and up per acre



AVAILABLE IN THREE SPREADING WIDTHS (24, 40 AND 50 FEET)

MODEL P710 BULK FERTILIZER SPREADER

New features for maintenance-free operation

- 16" (heavy duty) stainless steel apron.
- Stainless steel micro-meter adjusting screw.
- "I" beam sills to support hoods and give body greater rigidity.
- All-weather wheel drive; tires that won't go flat.

WRITE, WIRE OR PHONE COLLECT

for further information about the P710, plus a full line of other bulk fertilizer bodies, bulk feed bodies, bulk and sack bodies and unloaders.

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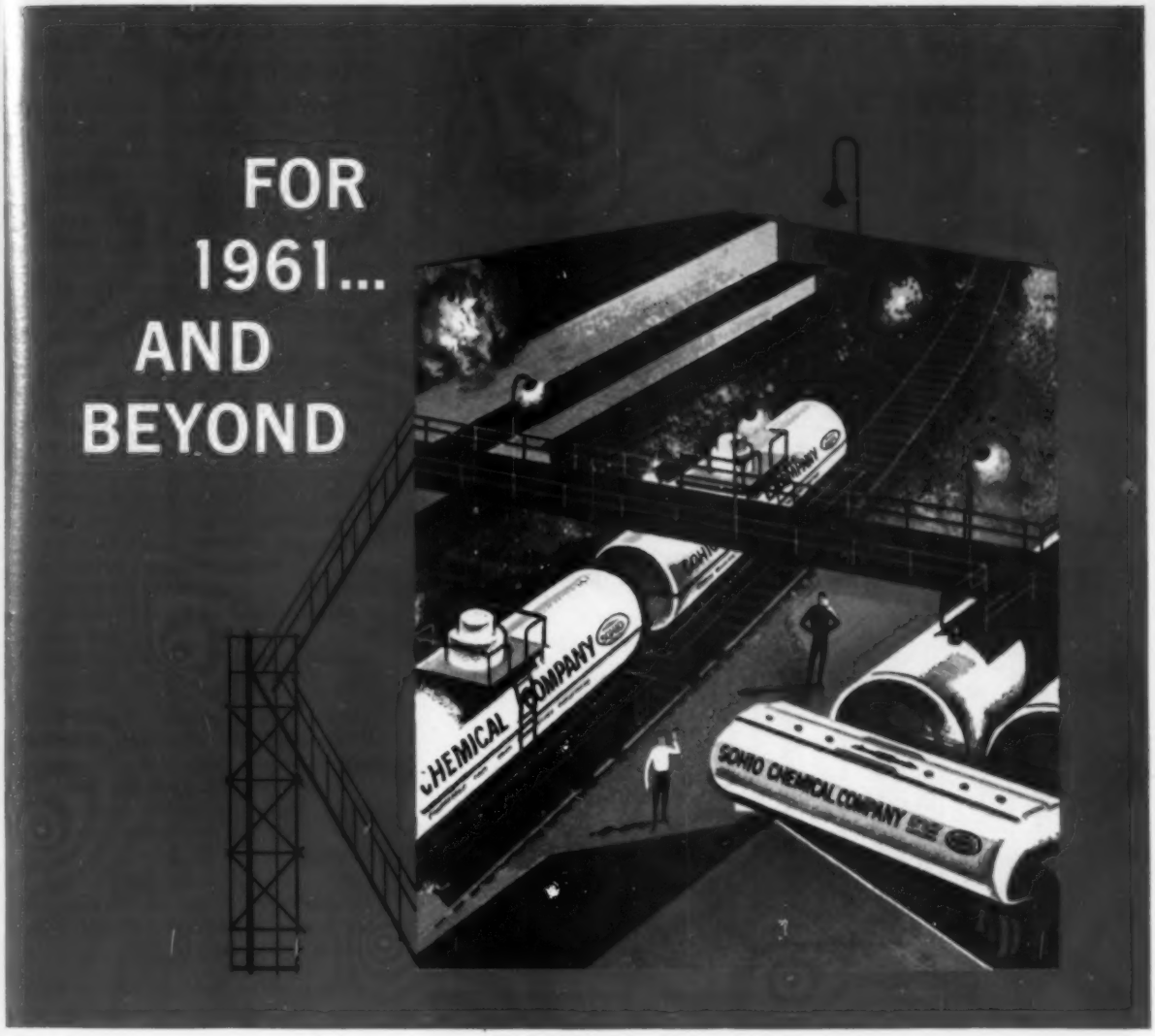
SIMONSEN MANUFACTURING CO.
Dept. CL QUIMBY, IOWA Phone 72



Fertilizer industry goals rate priority planning at SOHIO

Sohio's success depends upon a healthy, vigorous fertilizer industry. That's one of the reasons why Sohio lends full support to these goals that will benefit you and your company:

- Improvements in fertilizer technology and new developments in manufacturing.
- Advances in chemical control methods.
- Educational and public relations programs that benefit both the fertilizer industry and agriculture.
- Encouraging research in soil science, agronomy, fertilizer economics and related fields.

These goals have always rated priority planning at Sohio. They are the key to our thinking in providing products and services for you.

Call the "Man from Sohio" for details on Sohio SERVICE and a complete line of nitrogen materials: high-quality anhydrous ammonia . . . aqua ammonia . . . 45% coated or 46% uncoated urea . . . 18 nitrogen solutions, including all urea types.

SOHIO

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SOHIO CHEMICAL COMPANY

Agent for Solar Nitrogen Chemicals, Inc.

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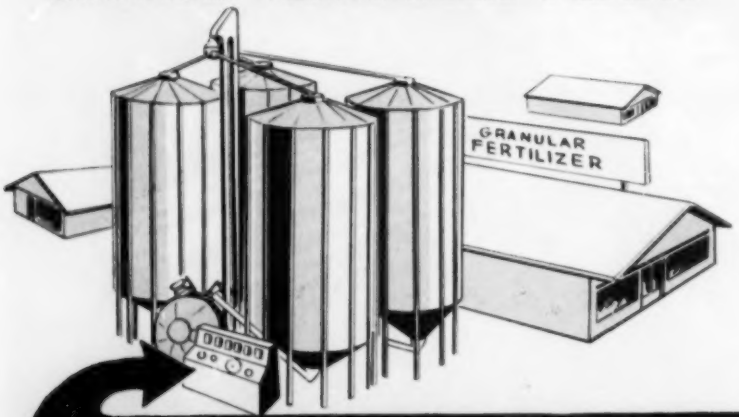
Phone CApitol 5-8015 or wire (TWX call letters LIMA O 497-U)

A-7

BIG PROFITS for YOU in the FARM SERVICE FIELD

with an **AGRI-BLEND** GRANULAR **FERTILIZER PLANT**



FULLY AUTOMATIC FORMULATION

For the first time in the bulk fertilizer business, Agricultural Business Company introduces this fully automatic blending plant . . . complete push button operation. The common sense approach to bulk handling.

- LOTS of STORAGE CAPACITY — up to 200 tons per tank
- FLEXIBLE DESIGN to suit your specific requirements. A bagging unit may be added
- FAST MIXING — up to 30 tons per hour
- LOW INVESTMENT as a do-it-yourself project or on a turnkey basis
- PUSH BUTTON OPERATION. A leg and conveyors do all the work
- LOW MAINTENANCE. Epoxy resin prevents corrosion, minimizes fertilizer condition problems

FOR DETAILS SEND FOR FREE BROCHURE

AGRI-BIZZ

Linking Farm and Industry

AGRICULTURAL BUSINESS COMPANY, INC.

BOX 36 • • • LAWRENCE, KANSAS

Associations Meetings

Forty bankers and members of the local fertilizer industry met recently at Grandview, Wash., to discuss the dollars per acre necessary to finance farmers in the area for their fertilizer and farm chemical needs. Herb Leighty, Cominco Products, discussed materials used in the area and distributed copies of the Fertilizer Salesman's Handbook. Warren Mallory, Collier Carbon & Chemical Co., suggested, "Perhaps the bankers should consider making it mandatory for the farmer to have his soil tested as one of the prerequisites for a loan." Todd Tremblay, regional director of the National Plant Food Institute, distributed mimeographed copies of fertilizer recommendations for important crops in the area. Cost in dollars per acre was worked out for all the crops under different management systems. John Thomas, Simplot Soil Builders, discussed farm chemical recommendations for crops. Chairman of the meeting was Ray Whitcomb, Bleyhl's Inc.

The **Washington Agricultural Chemicals Coordinating Committee** has been formed by representatives of national pesticide manufacturers, local distributors and dealers. Officials elected at a recent meeting in Yakima are R. E. Jones of Norkem Corp. as chairman; Sid Martin of Yakima Valley Spray as vice chairman and Robert Johnson of General Chemical Co. as secretary.

The pesticide industry has two major responsibilities to the community, said P. J. Reno, manager of Hercules Powder Co.'s Agricultural Chemicals Div. at the **13th Annual Pesticide School** at North Carolina State College in January. First, its products must, at all times, afford the highest degree of safety to the public. And the industry must tell the story of its sweeping accomplishments "truthfully, but forcefully—so that the public we serve may continue to benefit from the great resources our industry has made available."

Calendar

March 3. Midwest Agricultural Chemicals Association, meeting, Omaha, Neb.
March 13-15. Western Agricultural Chemicals Association, spring meeting, Disneyland Hotel, Anaheim, Calif.
March 15. Pacific Northwest Plant Food Association, 1961 convention, Sheraton Hotel, Portland, Ore.
March 21-30. American Chemical Society, national meeting, St. Louis, Mo.
April 12-14. Chemurgic Council, 26th annual conference, Sheraton-Gibson Hotel, Cincinnati, Ohio.
June 11-14. National Plant Food Institute, annual convention, The Greenbrier, White Sulphur Springs, W. Va.

SYMBOLS OF PLANT LIFE

Because of the complete ignorance of the masses during the Dark Ages, alchemists, with their knowledge of chemistry, were presumed to be in league with the devil. In experimenting with potash, they were forced to resort to signs and symbols. If they didn't . . . the result could be death!

Today, potash means life . . . life to promote food and fiber growth for an ever-growing population.

Southwest Potash Corporation provides a dependable supply of HIGH-K muriate for the plant food industry.

Distillation During 16th Century

SOUTHWEST POTASH CORPORATION

1270 Avenue of the Americas, New York 20, N.Y.

HIGH-K

**A commonly used 15th Century Symbol for Potash*

People

Porter

American Cyanamid Co. J. Miller Porter of the Phosphate and Nitrogen Dept., Agricultural Div., retired on Jan. 1. During his 32 years with the firm he held various management posts. Most recently under his sales planning supervision were ammonium sulfate, anhydrous ammonia and phosphoric acid.

Armour Agricultural Chemical Co. Robert White has retired as general manufacturing manager after 42 years of service. He is being retained as a consultant on fertilizer manufacturing operations, said W. E. Shelburne, president of the firm.

Aroostook Federation of Farmers. Dr. Philip B. Turner succeeds P. J. Sullivan as general manager. Sullivan, who retired recently after 38 years as general manager, was honored at a fairwell gathering in the Hotel Caribou, Caribou, Maine.

California Chemical Co., Ortho Div. C. E. Cody, western regional manager, announced promotion of Richard B. Price to regional products manager and John M. Hayden to assistant manager.

Odle

Geigy Agricultural Chemicals, division of Geigy Chemical Corp. has appointed D. L. Odle as its Iowa representative. A Kansas State University graduate, he will make his headquarters in Des Moines.

W. R. Grace & Co. Davison Chemical Div. Appointment of Harry K. Stueber as export sales manager, agricultural chemicals, has been announced. Mark H. German succeeds Basil Wagner, Jr., resigned, as territory representative on agricultural chemicals, working out of Baltimore.

Monsanto Chemical Co. has promoted George O. Mack from assistant manager to manager of corporate advertising.

Logan

Olin Mathieson Chemical Corp. New general manager of the Chemicals Div. is John O. Logan. A corporate vice president, Logan succeeds the late Edward Block as manager of the largest of the firm's six operating divisions. He had been associate general manager.

Spencer Chemical Co. L. E. Stollenwerck became director of public relations and Virgil S. Hanson, director of employee relations after resignation of Max W. Foresman as director of public and employee relations.

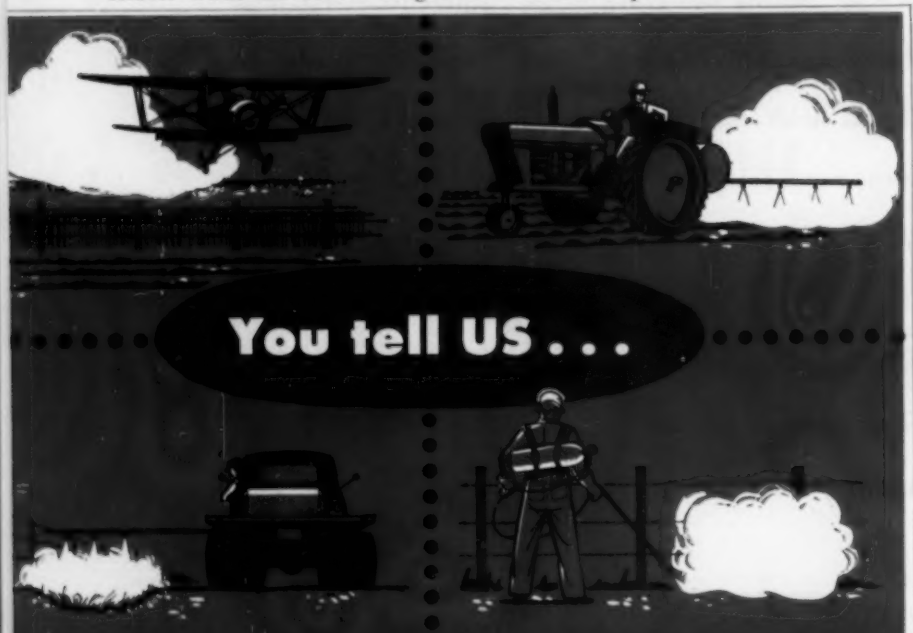
Texas Gulf Sulphur Co. Vice Presidents Hugh W. Strickland and Charles F. Fogarty have been promoted to senior vice presidents. Backmann G. Bedichek, assistant secretary, has been named senior counsel, and Harold B. Kline, administrative assistant, has been elected secretary of the company.

Strickland

Fogarty

Aiken

Union Bag-Camp Paper Corp. has annnounced that Dr. William H. Aiken joined the company on Feb. 15 as director of research and development. Dr. Aiken has directed research and development for Gardner Board and Carton Co. and most recently was a director and vice president, research and development engineering, of Personal Products Corp.



You tell us just what kind of weedicides, herbicides or insecticides you are formulating or wish to produce . . . and the application problems involved. Use the convenient coupon, or send a letter to our Chicago Research Division.

We will give you a prompt recommendation as to the APCO Petroleum Solvents which would best meet your specifications, and supply test samples at your request.

ANDERSON-PRICHARD OIL CORPORATION
LIBERTY BANK BUILDING • OKLAHOMA CITY 2, OKLA.

APCO INDUSTRIAL SOLVENTS

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Please recommend APCO Petroleum Solvents for:

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This familiar symbol represents the extra service behind . . .

SWIFT'S MINUTE MAN PHOSPHATES

Phosphate Rock— Ground and Unground Triple Superphosphate

The people at Swift's modern Phosphate Center are anxious to serve you. These are friendly, cooperative people who not only know phosphates but know the importance of good service to you.

For example, Swift's Phosphate Center includes a Customer Service facility where, through the magic of a modern, precise control system, you can get accurate, up-to-the-minute information on cars shipped, car numbers, dates and routing. Like the Minute Man, a minute's notice is all that is needed to put the system into action.

You'll enjoy doing business with Swift's Phosphate Center . . . with dedicated people who want to serve you. Have a Swift Phosphate Center Representative outline the advantages Swift's service offers you in phosphates—triple, phosphate rock or ground phosphate rock.

Swift PHOSPHATE CENTER

THE SERVICE CENTER FOR ALL YOUR PHOSPHATE NEEDS

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P-5

To Serve Your Industry Better WITH MINUTE MAN PHOSPHATE ROCK, GROUND PHOSPHATE ROCK AND TRIPLE SUPERPHOSPHATE

READER SERVICE

FREE INFORMATION to help you solve fertilizer, pesticide problems

Chemicals

67—ALIPHATIC AMINES

Armour Industrial Chemical Co. has published a booklet telling what aliphatic amines are and how they work. Trade named Armeens, these organic bases are derived from fatty acids. The booklet gives compositions as determined by gas chromatography and includes complete specifications, physical properties, reactions, and other data for primary, secondary, and tertiary amines, along with specialty and polyethoxylated amines. These chemicals are useful in plastics, rubber, paint, mineral flotation, and petroleum fields, among others. To get your copy,

CIRCLE 67 ON SERVICE CARD

68—PENNSALT'S PRODUCTS

The story of Pennsalt Chemicals is now available in a new brochure, *Pennsalt's Products—Where They Come From, How They're Made.* A chart traces development of typical Pennsalt products from the basic raw materials, through intermediate products and processes, to the final product sold to customers in almost every industry. To receive a copy,

CIRCLE 68 ON SERVICE CARD

69—FRITTED TRACE ELEMENTS

FTE, made by Ferro Corp., is applied commercially by mixing it into fertilizer or agricultural limestone. The trace elements have controlled solubility, having been combined with a mixture of "soft" glass. This releases the elements at a slow rate to the plants as the glass decomposes. Complete information may be obtained by

CIRCLING 69 ON SERVICE CARD

70—AGRIWET 9086

Nopco Chemical Co. has just prepared data sheets on Agriwet 9086 for pesticide formulators. The company says Agriwet 9086 offers rapid and thorough wetting of pesticidal wettable powders. It also is reported to prevent flocculation which occurs when wettable powders are dissolved in hard water or when two or more wettable powders are dispersed in combinations in the solution. To get your data sheets,

CIRCLE 70 ON SERVICE CARD

Process Equipment

71—TAKEUP FRAMES

Link-Belt's new multi-bearing takeup frames are especially designed to accommodate any type of bearing—babbitted, bronze, ball, or roller—in any two-bolt pillow block with mounting holes up to ⅝-inch. The new frames allow horizontal bearing adjustments from 6 to 24 inches and will mount 143 different bearing shaft sizes from ⅝-inch to 2 7/16-inch diameter. Mounting pads are easy adjusted to the mounting hole in the pillow block. The all-steel frames have strong channels that form a rugged box frame with high rigidity. To get a copy of Leaflet 2821, *Multi-Bearing Takeup Frames,*

CIRCLE 71 ON SERVICE CARD

72—STRAIGHT CENTRIFUGAL

Marine Products Company has recently published a colorful brochure on MP centrifugal pumps. MP straight centrifugal pumps are all iron construction with stainless steel shaft, and available in pipe sizes of ¾-inch, 1¼-inch, 1½-inch and 2 inches. Because MP pumps have a good mechanical seal on a stainless steel shaft, there is no leakage through the stuffing box. There are two ball bearings in every MP straight centrifugal pump for liquid fertilizer. The pumps can be belt driven or direct driven with gasoline engines or electric motors. You can obtain a copy by

CIRCLING 72 ON SERVICE CARD

73—WET FUME SCRUBBER

Solve dust problems with a Schutte and Koerting Company fume scrubber. They have no moving parts, require little maintenance, and are able to collect gases and finite particles simultaneously. Typical efficiencies with particulate size of 20 Micron are above 95% for single-stage operation at nozzle pressures of 40 to 60 psig. They are available in sizes up to 60 inches, to handle as little as two or as much as 73,500 cfm without blowers. For additional information

CIRCLE 73 ON SERVICE CARD

74—HOT WATER CONVERTERS

A new line of NiaWel hot water converters designed specifically for space heating service is described in a new bulletin from Niagara Weldments Inc. In addition to listing complete specifications covering 114 models in two and four-pass arrangements, the bulletin fully describes ASME construction of shells and removable U-tube bundles, metals and alloys available for special fabrications, and provides information for ordering models of other-than-standard size or construction. For your copy,

CIRCLE 74 ON SERVICE CARD

75—OVERSEAS OPERATIONS

Wheelabrator Corporation has just published a new brochure that pictorially describes its export facilities and world-wide operations. Especially helpful to U. S. manufacturers with overseas operations, the brochure describes distinctive Wheelabrator services and equipment designed to assist such manufacturers in setting up effective and economical metal cleaning or finishing departments, and in providing for efficient dust and fume control. To receive a copy,

CIRCLE 75 ON SERVICE CARD

76—DRY FEEDERS

Anyone handling chemicals, plastics, fertilizers, or industrial minerals will want to learn more about Tower dry feeders for uniform flow of pulverized, powder, or granular dry materials. Manufactured by Tower Iron Works, Inc., Tower dry feeders have the following features: Rugged and compact, available in alloys or carbon steel; economical fabricated construction for reduced weight with maximum strength; machined drum and casing with or without Teflon wiper blades; high capacity; suitable for use as air locks on low pressure differential applications. For additional information,

CIRCLE 76 ON SERVICE CARD

77—MOISTURE ANALYSER

A completely new, fully automatic, push button controlled instrument for measuring and calculating percent moisture or percent solids content has been introduced by Moore-Milford Corporation, specialists in moisture measurement and automatic controls. I-R Moisture Analyser's automatic built-in calculator provides final answer in percent moisture or percent solids on either light or heavy density materials. No specific weight of sample is required for the test and a sample can always be selected on the sole basis of proper size for efficient rapid far infrared drying. To learn more about this analyser

CIRCLE 77 ON SERVICE CARD

78—MONITOR SYSTEM

A high-speed automatic monitor (HAM) system with a scanning rate of up to 5000 inputs a second (200 microseconds per point), unique self-checking features, and a previously unattained order of reliability has been developed by Monitor Systems, Inc., a subsidiary of Epsco, Incorporated. The system is suitable for monitoring any test or process variable or variables up to 3600 where ultra-reliable performance is required. The HAM system will measure any variable or variables reducible to voltage form as well as rate-of-change of these variables, compare both to preset values, and convert this information into digit form. To learn more about the HAM system

CIRCLE 78 ON SERVICE CARD

79—COMPACT VALVES

Continental Manufacturing Co. has just published a new bulletin covering compact Tufline screwed end plug valves for instrument and process piping. Photographs and exploded views of the valves' components show how they provide bubble-tight closure in on-off service, plus corrosion resistance, absence of product contamination, and ease of oper-

how to use the READER SERVICE CARD

- *Circle number of literature you want*
- *Print or type your name, position, company and address*
- *Clip and mail the Service Cards on pages 26 and 34*

See page 54 for information on these Reader Service Numbers:

93—Easy Bag Handling
94—Bulk Handling
95—Accuracy
96—Efficient-Inexpensive
97—Better Packaging

ation. Each feature of the valve design—handle, bore configuration, straight-through flow passage, Teflon sleeve, tapered plug, Teflon diaphragm, and cover—is explained in a keyed diagram. For your copy,

CIRCLE 79 ON SERVICE CARD

80—NYLON STRAINER

Delavan Manufacturing Company has just introduced an new ¾-inch and 1-inch FPT nylon strainer. The strainer is available in 20, 40, and 80 mesh screens with more than 22 square inches of screen area. It is especially designed for high capacity and corrosion resistance. This strainer offers many features needed in the operation of both fertilizers and other agricultural chemicals. For a free catalog,

CIRCLE 80 ON SERVICE CARD

81—MULTI-WASH SCRUBBERS

A complete technical data booklet has just been published by Claude B. Schneible Company, manufacturers of multi-wash scrubbers. Multi-wash scrubbers handle the air pollution clean-up job with surprising efficiency (up to 99.9%). They have no moving parts and may be located outside the building, in the roof structure or on the roof itself. For your copy

CIRCLE 81 ON SERVICE CARD

Materials Handling

82—BUCKET ELEVATOR

Rex-Rated bucket elevators are featured in Bulletin 6057P, published by Chain Belt Company. Included in the bulletin are simplified selection charts and informational aids which allow quick and easy selection of centrifugal and continuous discharge elevator components. It contains basic data on such Rex components as chains, buckets, sprockets, bearings, and take-ups. To receive a copy,

CIRCLE 82 ON SERVICE CARD

83—FOLD-AWAY TANK

If your business requires you to haul both dry cargo and liquid products, you'll want to learn more about the Fold-Away tank, manufactured by Gates Rubber Company. You simply load a Fold-Away tank onto your truck bed, unroll the folded tank, and tie it down (using simple equipment furnished with tank). Fill the tank with almost any liquid and haul it easily. When the haul is over and the tank emptied, it can be folded and placed in one end of the truck bed. The truck can again be used to carry dry cargo. The tank is covered with specially compounded rubber that resists damaging effects of weather and is reinforced with heavy tie cord.

CIRCLE 83 ON SERVICE CARD

84—TANK SAVER

Anhydrous ammonia dealers may reduce their maintenance costs of tanks with Formula M-146 ammonia tank saver, manufactured by Spatz Paint Industries, Inc. This epoxidized rubber coating is resistant to the effects of inorganic chamicals such as anhydrous ammonia, hydrochloric, sulphuric, and phosphoric acids. It can be applied to bare metal surfaces or over old paint. Ingredients in Formula M-146 maintain its elasticity. This eliminates paint chipping problems that are characteristic of ordinary tank enamels. It offers extreme resistance to salt spray and other weather elements. For additional information, simply

CIRCLE 84 ON SERVICE CARD

85—DISPENSING PUMPS

A new line of drum and pail pumps has just been introduced by Multi-Meter Corporation. Model M45 pump is self-priming and dispenses exactly 4 ounces per stroke. Small containers can be filled from 5-gallon pails without spilling or waste. Model M855 pump is designed for use with 15-, 30-, and 55-gallon drums. It dispenses 8 ounces per stroke. Both pump models are constructed of rugged, machined steel parts, and are entirely nickel-chrome plated. They are self-venting and will provide leak-proof operation and long wear. To learn more about these dispensing pumps,

CICRLE 85 ON SERVICE CARD

86—THREE STAGE MAST

The Raymond Corporation has introduced a three stage mast which greatly increases the range of elevation in their line of narrow aisle electric forklift trucks. In a 2000-pound capacity "Reach Fork" truck, a model with a collapsed height of only 72 inches will lift as high as 147 inches. The 83-inch collapsed height model lifts to 180 inches. Full free lift is offered in the new design. Picture window visibility has been achieved by nesting the uprights, arranging the lifting cylinders in a compact cluster, and avoiding the need for additional oil lines and lifting chains. For free literature on this three stage mast,

CIRCLE 86 ON SERVICE CARD

Packaging

87—BAG SHAKER

A bag shaker accessory has been developed by E. D. Coddington Mfg. Co., for use on either their Auger-Matic or Air-Pac valve bag packers. It consists of two shaker arms powered by a small built-in electric motor which causes a reciprocal motion of the arms in contact with the bottom of the bag. This agitation of the bag throughout the entire filling operation causes the material—especially fluffy or course materials or other products which do not readily level themselves in the valve bags—to settle quickly into their most compact form, thereby assuring the use of minimum size bags and often bringing about considerable saving in bag costs. This shaker is attached to the front panel on the scale of either packer and a counterweight is provided to compensate for scale balance. To learn more about this bag shaker,

CIRCLE 87 ON SERVICE CARD

Application Equipment

88—SPRAY NOZZLES

Spraying Systems Co. has recently published three technical booklets on spray nozzles and related equipment. Bulletin No. 30 covers TeeJet spray nozzles and accessories, including strainers, connectors, spray guns, nozzles for broadcast spraying, valves, and fittings. Directo Valve with nylon body for selective spray control of booms is featured in Bulletin No. 100; diaphragm pressure relief valve in Bulletin No. 101. You can obtain copies simply by

CIRCLING 88 ON SERVICE CARD

89—CROWN PUMPS

Crown Manufacturing Co. recently introduced a complete new line of dependable, low cost pumps for pumping of liquid fertilizers. Crown pumps are available in self-priming centrifugal, straight centrifugal, and electric powered models. All models feature reliable cast iron construction, corrosion-resistant iron shaft seals, and replaceable volute and impeller. For complete details

CIRCLE 89 ON SERVICE CARD

90—MOBILE BLENDER

Your Land is Different, a booklet to help you sell more bulk fertilizer, has been published by Highway Equipment Company. Featured in the booklet is the New Leader mobile blender which accurately blends and spreads three fertilizers at once. It has three separate compartments and a 36-inch conveyor synchronized to speed of the truck by drive shaft drive. Growers are finding custom bulk spreading saves them time, equipment, and maintenance expense, plus up to $4 to $8 per acre over bagged goods. To receive a copy of this informative booklet,

CIRCLE 90 ON SERVICE CARD

91—BULK SPREADER

The Simonsen bulk fertilizer spreader is designed to spread high analysis fertilizers accurately and evenly, down to 75 pounds per acre. This spreader, manufactured by Simonsen Manufacturing Company, has non-corroding stainless steel at all critical points; hydraulic fan drive; all-weather wheel drive; outside compartment door hinges; simple adjustment for spreading rate; and rubber shock absorbers on hoods. For further information on Simonsen's complete line of bulk fertilizer bodies,

CIRCLE 91 ON SERVICE CARD

Miscellaneous

92—OUTDOOR STORAGE COVER

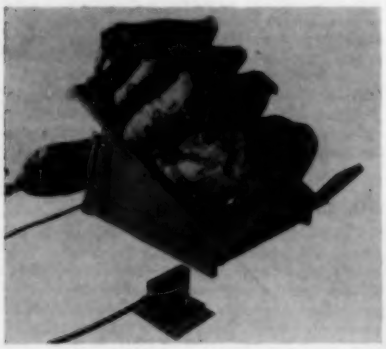
Burlene, a new plastic-laminated burlap outdoor storage cover, has been introduced by Bemis Bro. Bag Company. Benefits of the new construction include water resistance, tear and puncture resistance, and multiple-use achieved through the special burlap and polyethylene lamination process. A pre-formed construction prevents dirt and dust contamination of the item covered. Although water resistant, the plasticized construction permits escape of condensation which can cause rusting, discoloration, and rot. To learn more about Burlene, just

CIRCLE 92 ON SERVICE CARD

NEW AND NOTEWORTHY

EASY BAG HANDLING

Here is a new and better way to handle bags whether they be paper or burlap. The bag "destacker" receives hand truck loads of bags and separates the bags for single or multiple discharge. The unit pictured is designed to handle



ten 50-pound paper or five 100-pound burlap bags.

The hand truck operator tilts his load onto a receiving platform and starts the "destacking" cycle by pressing the foot switch. The conveyor boom lowers hydraulically to its discharge position at which time the 24-inch wide belt separates the bags by gravity discharge action. The machine is portable and designed to prevent damage to bags or contents.

This could save you a lot of time and money. Write J. H. Walker, president of the Fairfield Engineering Company, Unit Handling Division, Marion, Ohio, or just

CIRCLE 93 ON SERVICE CARD

BULK HANDLING

All of us are interested in bulk handling to cut costs and speed shipments. The National Plant Food Institute has

been working on this problem and the new Kaiser Nest-A-Bin may fit into your operation.

The containers can be shipped by air, rail or truck and can be handled with standard handling equipment. The bins can be easily nested for return shipment.

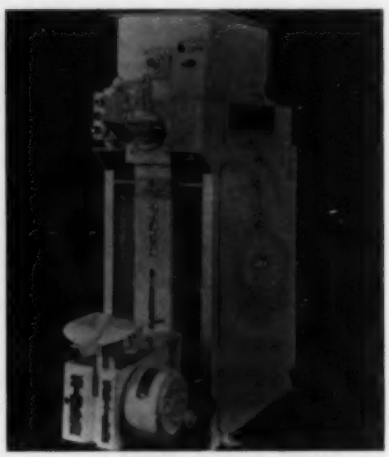
If you'll write Kaiser Aircraft & Electronics, Division of Kaiser Industries Corporation, 300 Lakeside Drive, Oakland 12, Calif., you'll be sent all of the facts, or just

CIRCLE 94 ON SERVICE CARD

ACCURACY

You have probably heard of the crackdown on short weights and measures by federal, state, and local authorities. A new bagger, more accurate than anything now available, should be part of your materials handling equipment.

The DX packer is electronically con-



trolled and will react to ¼ ounce against a capacity of 500 pounds. The new bagger is fast and can be easily changed over from one pack to another, and is ideal for powdered, granular, pelleted or flaked material.

You'll want to have all of the details on this new machine. Write H. L. Stoker Co., P. O. Box 112, Claremont 24, Calif., or

CIRCLE 95 ON SERVICE CARD

EFFICIENT-INEXPENSIVE

Last week I called on a company who is making a product you need. It's a

dust mask and is used throughout our industry. Light in weight—easy to breathe through—it's a mask your workers will wear. Still, it's highly efficient and being made of a pure latex filter, it will protect against dust particles 100 times smaller than the eye can see.

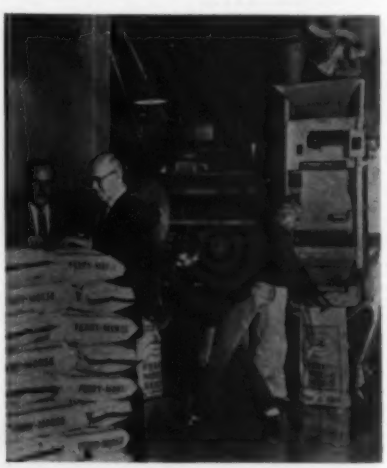
It's the lowest cost quality respirator on the market. If you will write John Hill of Flexo Products, Inc. 24865 Detroit Road, Westlake, Ohio, you will receive a brochure in the return mail or

CIRCLE 96 ON SERVICE CARD

BETTER PACKAGING

One of the world's largest seed houses has cut costs up to 56 per cent by packaging many of its 1572 varieties of seeds in Clupak extensible paper bags. Clupak extensible paper is similar in appearance to regular kraft paper but has been compressed and compacted in the manufacturing process so that it has an added measure of "give" or "stretch" which enables it to withstand greater impacts than the standard kraft.

Ferry-Morse uses a wide range of bag sizes, two popular sizes being 25- and 50-pound capacity units. The 25-pound bag measures 12x3x26½ inches and is comprised of three plies of 50-pound basis-weight Clupak extensible kraft. The outer ply is of bleached (white) stock and is coated with a 10-pound layer of polyethylene for moisture protection. The 50-pound bag is similar in construction, except that one extra ply is used.



Moisture protection is an important consideration in the seed industry. The new bags with the polyethylene lamination provide a high degree of protection. Why not write Bill Graves of Clupak, Inc., 530 Fifth Ave., New York, N. Y., and ask him to send you full particulars on how this extensible bag can be adapted to your use or

CIRCLE 97 ON SERVICE CARD

Presenting

THE MOST MODERN BAG PRINTER

Manufactured in

One, Two, Three and Four Colors for printing made up bags of Paper, Cotton and Burlap, new and used.

Let us send you complete information with descriptive literature.

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FOR YOUR CONVENIENCE

FARM CHEMICALS is now being published by AMERICAN FRUIT GROWER PUBLISHING COMPANY, Willoughby, Ohio. For prompt response, please address your correspondence, change of address or matters pertaining to your subscription to—

FARM CHEMICALS
Willoughby, Ohio

LIQUIDATING alcohol mfg. & grain processing plant at Omaha, Neb. Stills, dryers, filters, presses roller & hammermills, pumps, etc. Send for circular. Perry, 1430 N. 6th St., Phila. 22, Pa.

8 STEEL TANKS 28' x 10'4" in very good condition. Tanks are ¾" thick and were used for storage of sulfuric acid. Scrap Corporation of America—600 South Central Avenue, Baltimore, Maryland. Phone DIckens 2-6161.

OPPORTUNITY
ASSISTANT SUPERINTENDENT
For a national fertilizer company in Lansing, Michigan. Replies confidential. Write Box FC-1.

FOR SALE
Liquidating 3 Complete Breweries in Iowa, Michigan and Florida. Now Available: Steam Tube Dryers, Aluminum and Glass Lined Tanks, Grain Handling Equipment, Airveyor Systems, Write For Full Details: **Brewers & Bottlers Equip Corp., 105 Shields St., West Hartford, Conn.**

FOR SALE
6—Valley 36" Aluminum filter presses.
1—Worthington 70 cu. ft. rot. batch blender.
1—Raymond 66" 6-roll mill, rebuilt.
2—Raymond 50" 5-roller hi-side mills.
2—National 10' x 78' rotary dryers.
2—Davenport 8' x 60' rot. dryers, 7/16" welded.
1—7'-6" x 62' rotary cooler, 1/2" welded.
2—Bonnet 7' x 60' rot. dryers, 5/8" shell.
2—Bonnet 6' x 52' rotary dryers.
1—Louisville 6' x 50' steam-tube dryer.
1—Louisville 5' x 25' steam-tube dryer.
1—Louisville 4'-6" x 25' steam-tube dryer.
1—Standard 3' x 23' rotary dryer.
2—18,000 gal. vert. alum. tanks.
LARGEST STOCK OF
ROTARY DRYERS & COOLERS
Send for Circular #860-A
PERRY EQUIPMENT CORPORATION
1430 N. 6th St., Phila. 22, Pa. POplar 3-3505

Marketing "goofs"

(Continued from page 22)

a professional and you may not realize how much trouble a greenhorn can get into.

Another question which is a real corker—and we frequently get this type of question is: "At what number should I set my spreader for XYZ material."

Or "I have one man's material and another man's spreader, now what number should I set it on."

One lady who attended our turf field day this year said, "I use number 3 for everything; do you think that's OK?"

If our present lawn spreaders cannot be improved, let's make a fool-proof applicator, possibly where the material container is an integral part of the application equipment. With this system, the flowability of materials could be predetermined and a package could be sold which could be applied without error.

Regarding the use of liquid and dry materials, let's suggest teaspoons and tablespoons and cupfulls, pints and quarts. Very few homeowners have facilities to weigh out dry ounces and pounds. With some materials, one person at the factory could do the weighing one time for several thousand others.

LABELING—MAKE IT SIMPLE

One further point on materials—the label. I believe the label should first answer one question—how much. If people are going to do a limited amount of reading, let's get this point across first. Also on labels, if you have a weed killer which entails certain precautions or limitations, let's be proud of the fact that we know what they are. Don't hide it in fine print. I believe that a home gardener is entitled to a full explanation of what to expect, and in many instances, why to expect certain results. Incidentally, most of the county agents who replied to my questionnaire were in complete agreement on these points regarding the label.

Let me also mention some of the specific comments which were made by county agents, who are sincerely interested in performing a fine job in nearby counties which have an urban population.

(1) Several stated that many commercial concerns emphasize trade names rather than the actual ingredients. This often causes confusion.

(2) There is often over emphasis upon making the lawn weed control job look too easy. This causes frustration for the homeowner as well as the agent.

(3) Too often we hear about misinformation stating that the material is a cure-all for everything when in fact it is not. This doesn't help anybody.

(4) Finally, in some instances, the label on herbicidal materials which are recommended state that the purchaser should consult his county agent for more complete information about using the material. This is often embarrassing because the material may not even be recommended in that county agent's state.

Quality Control

(Continued from page 30)

ized fines are being sucked upward through the revolving centrifugal selector arms by a whirlwind exhaust fan. The unit is powered by a dust-jacketed 40 hp motor.

The Pulver-Mill was initially put into full operation early in 1960, under a conditional contract with the Dorchester manufacturer, whereby Sturtevant guaranteed performance. The unit, which operates at optimum efficiency when pressure and input are within one or two inches of mercury at atmospheric pressure—so as not to use suction or back pressure—has performed above expectations.

Now, Shell is able to supplement a quality line of granular agricultural chemicals and field-strength dusts with fine concentrates for spraying and other uses which call for the increasingly-used 95 per cent 325 mesh particles.

The company markets its products through a jobber-dealer organization throughout Canada. Aldrin and dieldrin, both used for under-the-soil pest control (dieldrin is also used for applications on the plants proper) are sold primarily in western and central Canada. DDT primarily for plant application, has more general distribution.

The products are normally packaged in 3, 4, 5 and 10-lb. containers and 25 and 50-lb. multi-wall bags. Ten per cent of plant output is private-label production—a reversal of the role played by Shell three short years ago.

The Pulver Mill, which played such a key part in Shell's product expansion program, is the standard Sturtevant impact mill, introduced in May 1959. Depending upon product handled and size desired, it will process up to 5000 lbs/hr. Since its introduction, Sturtevant has expanded the Pulver-Mill line twice. In May 1960, the company announced 15,000/lbs/hr units. In December, the Boston firm introduced a pilot-plant and small capacity mill, which handles soft and medium-hard materials in the hundreds-of-pounds-an-hour range.

Sturtevant also fabricates a complete dry processing equipment line including centrifugal air selectors, blenders, fluid energy mills, pulverizers, laboratory equipment and other machines.

MONARCH SPRAYS

This is our Fig. 645 Nozzle. Used for Scrubbing Acid Phosphate Gases. Made for "full" or "hollow" cone in brass and "Everdur." We also make "Non-Clog" Nozzles in Brass and Steel, and

Stoneware Chamber Sprays

now used by nearly all chamber spray sulphuric acid plants.

CATALOG I

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SHUEY & COMPANY, Inc.

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Standard Reference Guide for the Farm Chemicals Industry
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Larger and completely revised for 1961. This chart tells at a glance just what chemicals mix safely.

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(no other product like it . . . anywhere)

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2. **Attractive styling:** Smartly designed to suit the most discriminating wearer.
3. **Filtering efficiency:** Filters non-toxic dusts 100 times smaller than the eye can see.
4. **Easy-breathing comfort:** Easier to breathe through and talk through than an ordinary pocket handkerchief.
5. **Feather-like weight:** Weighs only 1 ounce complete.
6. **Simplicity and economy:** Only 4 tough, long-wearing inter-locking parts — all washable. Pure latex filter outwears throw-away type more than 100 to 1.

No wonder FLEX-A-FOAM is the one dust respirator workers welcome and WEAR!

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SPRAY NOZZLES
and related equipment

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TeeJet Spray Nozzles —write for Catalog 30.

ACCESSORIES — a complete choice of line strainers, split-eyelet connectors, spray guns, nozzles and equipment for broadcast spraying, control valves, pressure relief valves and fittings.

DirectoValve with Nylon valve body supplied in one, two and three valve unit assemblies for selective spray control of booms and accessories. Write for Bulletin 100.

Diaphragm Pressure Relief Valve —write for Bulletin 101.

SPRAYING SYSTEMS CO.
3280 Randolph Street • Bellwood, Illinois

How we can save the "American System"

You've been getting a steady diet of fairly frank discussions of how the marketing concept works in the farm chemicals industry the past couple of issues. We hope you profit from these ideas.

Actually, it may be later than we think! Our entire American System is under attack from without and within.

If you've read "The Waste Makers" by Vance Packard, and other books which spread a false gospel to the American public, then you know why we're concerned.

The ideas they disseminate run counter to the marketing concept and to the private enterprise philosophy that made this country great!

There are those who earnestly feel that government must take over more and more activities of private business.

The farm chemicals industry can do something about this alarming trend toward government expansion and a growing public hostility toward profits of any kind.

First—Help your dealer.

One of the reasons this magazine is running its current series on "How the Fertilizer Manufacturer Can Help its Dealers" is that we believe in the old cliche:

No chain is any stronger than its weakest link.

Those attending last year's FCMS will remember Dr. Henry Bund, Research Institute of America saying:

"If marketing is to carry through its concept of integration, it must encompass all of the links of the chain which ultimately connects the production line with the final consumer.

It means that the manufacturer's marketing executive must stake as deep an interest in the outside independent dealer whose services he uses as he does in his own commissioned or salaried salesmen, he added.

Dr. Bund said it also means that the "outside" organization must begin to think of itself as an integral part of the manufacturer's marketing setup—one which can function effectively only if it is fully integrated in the total marketing plan for the particular product or line."

He added that to the extent to which the dealer or distributor *assumes* these new responsibilities and become essential parts of the total marketing effort, *another "important problem" will have been brought much closer to its ultimate solution.* And he warned, "Don't minimize this problem, because you'll he hearing more about it as time passes."

What was he referring to? Of course, it was the favorite "whipping boy" of such false prophets as Vance Packard—our distribution system.

We read an interesting rejoinder to Packard's accusations the other day, by Lawrence Fertig in the *New York World-Telegram*:

"Waste, waste, waste, he says; waste in style changes, in convenient and attractive packaging, in everything. (Would the author like to go back to buying unpackaged butter out of a tub and unpackaged flour out of a sack?) The very statement of this premise reveals how ridiculous it is.

"Anyone who owns an automobile, an air conditioner, a refrigerator, or a washing machine knows how serviceable these products are. It's plain to every schoolboy that the success of an American business depends on products as *good* as possible so that they will build brand name equity."

Next—adopt a new philosophy.

Demand for fertilizers in 1961 is expected to be slightly above the 1960 level, according to the latest Department of Commerce report.

"The industry is in a better inventory position than a year ago, and little if any increase in rate of production over that of 1960 will be needed to satisfy the possible small increase in demand," the report added.

"However the fertilizer industry is optimistic about the long-range future because extensive expansion in capacity of various basic fertilizer materials is underway or planned." (Some of this activity was reported on this page last month.)

"Fertilizer production and sales in 1960 exceeded the 1959 record . . . consumption in 1960 is estimated to have been about 1 percent ahead of the preceding year," the report continued.

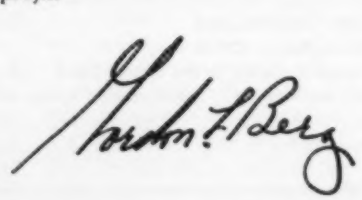
But while consumption of fertilizer is going up, profit margins continue to skid.

Dr. Henry Bund told those attending last year's Farm Chemicals Marketing Seminar:

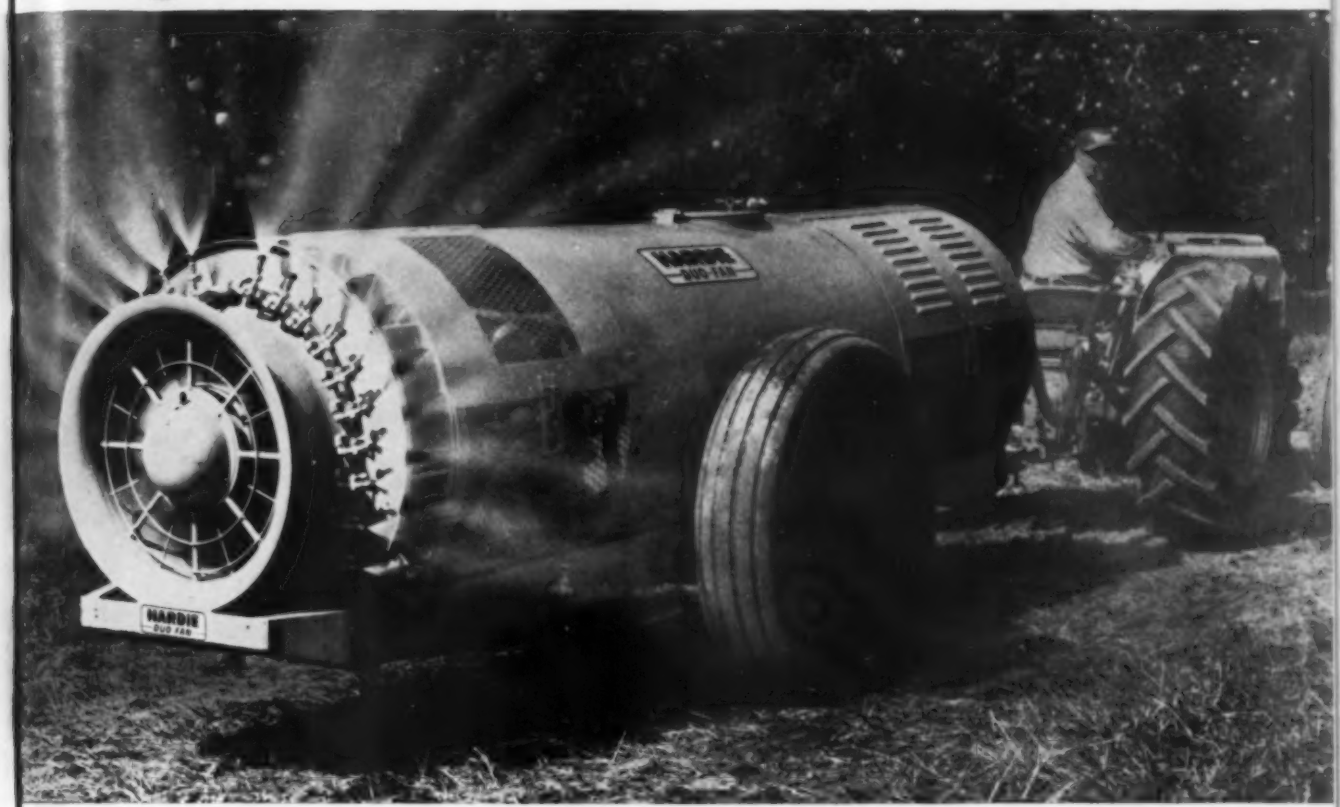
"Let us examine whether the new marketing concept may not offer a cure or at least a medication which would greatly alleviate the most distressing symptoms of this disease of price shading and hidden concessions."

"Starting with the manufacturer, it should be obvious that his marketing manager cannot possibly be as prone to resorting to indiscriminate price cutting, dumping of merchandise . . . as his sales manager predecessor might have been."

It must be part of the new philosophy (outlined so well in "Stu" Bear's article last month, "How Niagara Reorganized for profits") . . . *that no volume is worth going after that doesn't turn in a reasonable . . . margin of profit.*"



FARM CHEMICAL TANKS SHOULD BE MADE OF Ingersoll STAINLESS-CLAD STEEL



Hardie Duo-Fan Air Blast orchard sprayer with tank made of IngAclad Stainless-clad Steel

WHY?

Because highly corrosive farm chemicals cannot attack the stainless steel lining made of Ingersoll IngAclad *stainless-clad steel*

HERE ARE THE FACTS:

1. IngAclad stainless-clad steel is priced approximately 28% less than solid stainless steel.
2. Stainless-clad steel tanks outlast ordinary steel tanks by many, many years.
3. 20% of the total sheet thickness is Ingersoll stainless steel.
4. The stainless layer is type 304 (18-8) Stainless.
5. Leading sprayer manufacturers are now specifying IngAclad steel for their chemical sprayer tanks.

(Ingersoll is the only manufacturer of single-clad stainless-clad steel sheets.)

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